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AMERICAN MATHEMATICAL SOCIETY

Notices

Edited by J. H. CURTISS

ISSUE NO. 25 *AUGUST, 1957*

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CALENDAR OF MEETINGS

Note: This Calendar lists all of the meetings which have been approved by the Council up to the date at which this issue of the *Notices* was sent to press. The meeting dates which fall rather far in the future are subject to change. This is particularly true of the meetings to which no numbers have yet been assigned.

Meeting No.	Date	Place	Deadline for Abstracts
538	October 26, 1957	Washington, D. C.	Sept. 12
	November, 1957	Columbia, Missouri	
	November 15–16, 1957	Los Angeles, California	
	November 29–30, 1957	Coral Gables, Florida	
	January 28–30, 1958 (64th Annual Meeting)	Cincinnati, Ohio	
	April 18–19, 1958	Chicago, Illinois	
	April 18–19, 1958	Stanford, California	
	June 20, 1958	Corvallis, Oregon	
	August 25–30, 1958 (63rd Summer Meeting)	Cambridge, Massachusetts	
	November, 1958	Evanston, Illinois	
	November, 1959	Detroit, Michigan	

The *Notices* of the American Mathematical Society is published seven times a year, in February, April, June, August, October, November, and December. Inquiries should be addressed to the American Mathematical Society, Ann Arbor, Michigan, or 190 Hope Street, Providence 6, R. I.

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SIXTY-SECOND SUMMER MEETING
and
THIRTY-SEVENTH COLLOQUIUM

Pennsylvania State University
University Park, Pennsylvania
August 27–30, 1957

PROGRAM

The sixty-second summer meeting and the thirty-seventh Colloquium of the American Mathematical Society will be held from Tuesday, August 27, through Friday, August 30, 1957, at Pennsylvania State University, University Park, Pennsylvania, in conjunction with a meeting of the Mathematical Association of America from Monday, August 26, through Thursday, August 29, a meeting of the Society for Industrial and Applied Mathematics on Monday, August 26, and Tuesday, August 27, and a meeting of Pi Mu Epsilon Fraternity on Monday and Tuesday, August 26 and 27. Some mention of the programs of these other meetings will be found in the Time Table for the Society meeting, and elsewhere in these *Notices* under *Activities of Other Associations*, but for details one should consult the programs of the individual organizations. *All times listed in this program are Eastern Daylight Saving Time.*

Professor N. E. Steenrod of Princeton University will deliver the Colloquium lectures, entitled *Cohomology operations, and obstructions to extending continuous functions* on Tuesday at 2:00 P.M. and Wednesday at 9:00 A.M. in Schwab Auditorium, and on Thursday and Friday at 9:00 A.M. in Sparks Building, Room 121.

By invitation of the Committee to Select Hour Speakers for Annual and Summer Meetings, Professor A. P. Calderón of the Massachusetts Institute of Technology will address the Society on Wednesday at 11:00 A.M. on *Singular integrals and differential equations* in Schwab Auditorium, and Professor M. A. Rosenlicht of Northwestern University will deliver an hour address entitled *Rationality questions on algebraic groups* on Thursday at 10:30 A.M. in Sparks Building, Room 121.

Sessions for contributed papers will be held at 3:30 P.M. on Tuesday, at 2:00 P.M. on Wednesday, at 2:00 P.M. on Thursday, and at 10:30 A.M.

on Friday. Sessions for late papers (received on or before August 5) will be held at 1:30 P.M. on Friday. Programs for the sessions of late papers will be available in mimeographed form at the registration desk.

There will be a business meeting of the Society in Schwab Auditorium at 10:00 A.M. on Wednesday, at which time action on a number of amendments to the by-laws will be taken. One of these sets the dues of corporate members. The others are necessitated by the fact that the 1957 Annual Meeting is planned for late in January, 1958, which is outside the limits set by the present by-laws. This also requires a change in the procedure for the election of officers, which has always been completed at the Annual Meeting. It is proposed to have the election of officers strictly by mail ballot and completed by the middle of November. There is also an amendment concerned with the dates of Trustees' meetings and the manner of calling such meetings.

The Council of the Society will meet at 5:00 P.M. on Tuesday in the Beta Theta Pi fraternity.

The Employment Register will be available throughout the meeting in Waring Hall, Room 127. Details will be available at the registration desk.

REGISTRATION

Registration headquarters will be on the first floor of Waring Hall, and will be open Sunday afternoon and evening, and from 8:30 A.M. to 5:00 P.M., Monday through Friday. All those attending the meetings are requested to register as soon as possible. A directory of all persons registered, an information desk, a mail window, and the text book exhibits will be located in the registration area.

There will be a registration fee of $1.00 for each member of any of the participating organizations and $.50 for each accompanying adult.

ROOMS AND MEALS

Dormitory accommodations are available in Waring Hall, with dining room service in the same building. *Members taking accommodations in dormitories will be required to purchase meal tickets for the Waring Hall dining room.* The dining room will be open from Monday breakfast until the close of the meetings. Dormitory rooms may be occupied from Sunday evening, August 25, until the following Saturday. A late-reservation form will be found on page 67. Members who did not return the form sent with the June *Notices* are requested to return the late-registration form to Mr. T. Reed Ferguson, Extension Conference Center, University Park, Pennsylvania, as soon as possible, regardless of whether or not they wish dormitory reservations.

Prices are as follows:

Rooms: Double rooms (whether occupied by 1 or 2 persons).... $5.00
Single rooms (very limited number available) 3.00
Meals: Per day 3.50

Two hotels and a number of motels are available in State College. Meals may be secured at any of a number of town restaurants or at the Hetzel Union Building on the campus. Reservations should be made directly with the hotels or motels. Because of other meetings in State College, as well as the normally heavy vacation traffic in central Pennsylvania, it is suggested that *requests for hotel or motel reservations be made as soon as possible.* The post office address for all places of business is *STATE COLLEGE, PENNSYLVANIA.*

HOTELS AND MOTELS

Nittany Lion Inn ADams 7–7671	N. Atherton Street	S: $5.00–$7.00 D: 8.00–12.00
Hotel State College ADams 8–6733	W. College Avenue	S: 3.50– 6.00 D: 6.50–10.00
Autoport ADams 7–7666	S. Atherton Street	S: 4.00– 7.00 D: 5.00– 9.00 Family Rooms: 9.00– 15.00
College Court Motel ADams 7–4750	N. Atherton Street	D: 7.00– 8.00
Horlacher's ADams 7–4947	S. Atherton Street	S: 4.00 D: 7.00
Nittany Manor ADams 7–7638	N. Atherton Street	S: 6.00 D: 8.00– 9.00
Penn State Motel ADams 7–3201	N. Atherton Street	S: 4.00 D: 6.00– 7.00
Ranch Court ADams 7–7762	S. Atherton Street	S: 5.00 D: 8.00
Taylor's Motel ADams 8–9045	N. Atherton Street	S: 4.00 D: 7.00–10.00
Travelers Lodge	N. Atherton Street	S: 5.00 D: 7.00

The Nittany Lion Inn is on the campus; the State College Hotel is opposite the main campus gate, and the motels are all within two miles

of the campus.

ENTERTAINMENT AND RECREATION

Lounges in Waring Hall and in the West Dormitories will be open at all times. Lounges and social rooms of the Hetzel Union Building (HUB) will be open from 7:30 A.M. to 10:00 P.M. Coffee, light meals, and refreshments may be obtained at one of the restaurants in the basement of the HUB during these hours.

The University Golf Course (greens fee $2.00) and tennis courts are available to members and their families. The swimming pool in the Glenland Building will be open late afternoons (fee $0.25). Swimming is also provided at public recreation areas in the mountains near State College; in particular, at Whipple Dam (12 miles from the campus).

On Monday, August 26, at 8:00 P.M., Sigma Delta Epsilon Honorary Society is holding a social hour in the Recreation Room of Hamilton Hall for women attending the meetings.

A reception for members of all mathematical organizations and their guests will be held in the Hetzel Union Building at 4:30 P.M. on Wednesday, August 28. Following the reception there will be a dinner in the banquet hall of the Hetzel Union Building at 6:00 P.M., price $2.75. There will be a chicken barbecue Thursday afternoon, August 29, at 5:00 P.M., price $2.50.

A limited number of seats will be reserved for performances of the Standing Stone Players, Neff's Mills, Pennsylvania. There will be conducted tours of the campus at various times during the meetings. Reservations for these activities should be made at the registration desk.

CHILDREN

A list of baby sitters will be available at the registration desk. Fees range from $.50 to $1.00 per hour depending upon the service expected. If there is a sufficient number of children between the ages of 3 and 6 years, the University Nursery School can be made available during the mornings. Requests for assistance should be made at the time of registration.

TRANSPORTATION

Pennsylvania State University is located in the borough of *STATE COLLEGE, PENNSYLVANIA.* (The name University Park applies only to the postal zone on the campus itself.) It is on highway routes Pennsylvania 45, and Pennsylvania 545, and U. S. 322. It is served directly by both the Greyhound and the Edwards Lakes-to-Sea bus lines.

Allegheny Airlines serves central Pennsylvania, stopping at Black

Moshannon Airport. Limousine or cab service to the campus is $2.75.

State College is served by the Pennsylvania Railroad which picks up and discharges passengers at Lewistown (30 miles away) and Altoona (40 miles away). The Boalsburg Auto Bus Co. bus leaves the Pennsylvania RR station in Lewistown for State College daily at 12:40 P.M. and 6:45 P.M., EDT, and on Fridays and Sundays at 9:40 P.M. Greyhound Lines provide bus service between Altoona and State College, leaving Altoona daily at 9:18 A.M., 3:33 P.M., and 7:28 P.M., EDT. *No bus service is available at other hours.*

MAIL AND TELEGRAMS

Correspondence for those attending the meetings should be addressed in care of the American Mathematical Society, Waring Hall, Pennsylvania State University, University Park, Pennsylvania. Mail may be obtained from the mail window in the registration area.

Committee on Arrangements:

J. B. Bartoo — H. L. Krall
Orrin Frink — H. M. Gehman
W. O. Gordon — R. D. Schafer
Evan Johnson, Jr., Chairman

TIME TABLE

(Eastern Daylight Saving Time)

SUNDAY, AUGUST 25

Afternoon and evening. Registration, Waring Hall.

MONDAY, AUGUST 26

8:30 A.M. –5:00 P.M. Registration, Waring Hall.

9:00 A.M. MAA Session, 121 Sparks Building. Hedrick Lecture I, Leo Zippin; Albert Edrei; V. L. Klee, Jr.

2:00 P.M. MAA Session, 121 Sparks Building. Hedrick Lecture II, Leo Zipppin; J. R. Mayor; K. O. May.

5:30 P.M. National Pi Mu Epsilon Council, 127 Waring Hall.

7:00 P.M. Pi Mu Epsilon, 228 Sparks Building.

7:30 P.M. MAA Board of Governors, Beta Theta Pi fraternity.

7:30 P.M. SIAM Session for contributed papers, 312 Sparks Building.

8:00 P.M. Sigma Delta Epsilon social hour, Hamilton Hall recreation room.

Employment Register

TUESDAY, AUGUST 27

8:30 A.M. –5:00 P.M. Registration, Waring Hall.

9:00 A.M. MAA Session, 121 Sparks Building. Hedrick Lecture III, Leo Zippin; Business Meeting; J. W. Green; Mina S. Rees

9:00 A.M. SIAM Open Council, 228 Sparks Building.

2:00 P.M. Colloquium Lecture I, Schwab Auditorium, N. E. Steenrod

3:15 P.M. SIAM Session, 110 Electrical Engineering. Invited Lecture, Hartley Rogers, Jr.

3:30 P.M. Sessions for contributed papers, Sparks Building.
Analysis, Room 10.
Topology, Room 121.
Algebra and Theory of Numbers, Room 316.

3:30 P.M. Pi Mu Epsilon, 228 Sparks Building.

4:30 P.M. SIAM Session for contributed papers, 110 Electrical Engineering.

5:00 P.M. Council, Beta Theta Pi fraternity.

7:30 P.M. MAA Section Officers, Hetzel Union Building, second floor.

7:30 P.M. SIAM Session, 110 Electrical Engineering. Invited Lecture, Robert Charpie.

9:00 P.M. SIAM Beer Party (place to be announced).

Employment Register.

WEDNESDAY, AUGUST 28

8:30 A.M. –5:00 P.M. Registration, Waring Hall.

9:00 A.M. Colloquium Lecture II, Schwab Auditorium, N. E. Steenrod

10:00 A.M. Business Meeting, Schwab Auditorium.

11:00 A.M. Invited Address, Schwab Auditorium, A. P. Calderón.

2:00 P.M. Sessions for contributed papers.
Analysis, 10 Sparks Building.
Applied Mathematics, 110 Electrical Engineering.
Algebra and Theory of Numbers, 316 Sparks Building.
Geometry, 228 Sparks Building.

2:00 P.M. MAA Session, 121 Sparks Building, S. S. Wilks;
Symposia on Probability and Statistics, Logic and Foundations.

4:30 P.M. Reception, Hetzel Union Building.

6:00 P.M. Banquet, Hetzel Union Building.

Employment Register.

THURSDAY, AUGUST 29

8:30 A.M. –5:00 P.M. Registration, Waring Hall.

9:00 A.M. Colloquium Lecture III, 121 Sparks Building, N. E. Steenrod.

10:30 A.M. Invited Address, 121 Sparks Building, M.A. Rosenlicht.

2:00 P.M. Sessions for contributed papers, Sparks Building.
Analysis, Room 10.
Topology, Room 316.
Statistics and Probability, Logic and Foundations, Room 228.

2:00 P.M. MAA Session, 121 Sparks Building. R. L. Davis; J. G. Kemeny; Symposia on Freshman Courses, Calculus for Freshmen.

5:00 P.M. Barbecue.

Employment Register.

FRIDAY, AUGUST 30

8:30 A.M. – 5:00 P.M. Registration, Waring Hall.

9:00 A.M. Colloquium Lecture IV, 121 Sparks Building, N. E. Steenrod.

10:30 A.M. Sessions for contributed papers, Sparks Building.
Analysis, Room 10.
Analysis and Applied Mathematics, Room 121.
Algebra and Theory of Numbers, Room 316.

1:30 P.M. Sessions for late papers, Sparks Building.

Employment Register.

PROGRAM OF THE SESSIONS

(Time limit for each contributed paper, 10 minutes)

TUESDAY, 2:00 P.M.

Colloquium Lecture I, Schwab Auditorium

Cohomology operations, and obstructions to extending continuous functions (One hour)

Professor N. E. Steenrod, Princeton University

TUESDAY, 3:30 P.M.

Session on Analysis, Sparks Building, Room 10

(1) Converse forms of the Hadamard product theorem
Professor R. C. Buck, University of Wisconsin

(2) Distortion theorems for real star mappings
Dr. John Harton, Jr., Motorola, Inc., Riverside, California

(3) On the critical points of a multivalent function
Professor A. W. Goodman, University of Kentucky and Institute for Advanced Study

(4) Bieberbach's conjecture for schlicht functions
Professor Harold Shniad, University of Arkansas

(5) On the lower order of meromorphic functions with deficient values
Professor Albert Edrei, Syracuse University and Professor W. H. J. Fuchs, Cornell University

(6) On a question raised by I. Schur. Preliminary report
Mr. I. H. Sublette, Radio Corporation of America, Camden, New Jersey
(Introduced by Professor Seymour Sherman)

(7) Linear difference and differential equations satisfying conditions at more than one point
Professor Tomlinson Fort, University of South Carolina

(8) On the reducibility of some linear differential operators
Professor M. S. Klamkin, Avco Research and Advanced Development Division and Polytechnic Institute of Brooklyn, and Dr. D. J. Newman, Avco Research and Advanced Development Division

Session on Topology, Sparks Building, Room 121

(9) On iterated loop spaces of suspensions
Mr. William Browder, Princeton University

(10) On the suspension of the loop space. Preliminary report
Professor W. D. Barcus and Dr. J.-P. Meyer, Brown University

(11) Duality theorem for homology manifolds
Mr. Frank Raymond, University of Michigan

(12) On maps of spheres into euclidean spaces
Professor C.-T. Yang, University of Pennsylvania

(13) Fibre bundle techniques in the modification of complex analytic structure
Professor Eugenio Calabi, University of Minnesota

(14) Lebesgue area zero, dimension, and fine-cyclic elements
Professor R. F. Williams, Purdue University

(15) On *2* dimensional Lebesgue area. II
Professor M. R. Demers, University of Nevada and Brown University, and Professor Herbert Federer, Brown University

(16) Some properties of compactifications. I
Professor Melvin Henriksen, Purdue University, and Professor J. R. Isbell, University of Washington

Session on Algebra and Theory of Numbers, Sparks Building, Room 316

(17) On integral bases
Professor H. B. Mann, Ohio State University

(18) The proper representation of integers as sums of three squares
Professor Emil Grosswald, University of Pennsylvania, Professor Anne Calloway and Professor J. M. Calloway, Carleton College

(19) A generalization of the Euler ϕ-function
Professor H. L. Alder, University of California, Davis

(20) Completeness of quotient algebras of Boolean algebras
Professor Philip Dwinger, Purdue University

(21) Some remarks on Boolean duality
Professor F. B. Wright, Tulane University

(22) A note on the lattice of topologies
Dr. Juris Hartmanis, General Electric Research Laboratory, Schenectady, New York

(23) A representation theorem for universal algebras
Professor R. P. Dilworth, California Institute of Technology

(24) Composita, equations, and freely generated algebras
Dr. Anil Nerode, University of Chicago

WEDNESDAY, 9:00 A.M.

Colloquium Lecture II, Schwab Auditorium

Cohomology operations, and obstructions to extending continuous functions (One hour)

Professor N. E. Steenrod, Princeton University

WEDNESDAY, 10:00 A.M.

Business Meeting, Schwab Auditorium

WEDNESDAY, 11:00 A.M.

Invited Address, Schwab Auditorium

Singular integrals and differential equations (One hour)

Professor A. P. Calderón, Massachusetts Institute of Technology

WEDNESDAY, 2:00 P.M.

Session on Analysis, Sparks Building, Room 10

(25) Sufficient conditions for the existence of periodic solutions of systems of weakly non-linear first and second order differential equations

Mr. J. K. Hale, Remington Rand Univac, St. Paul, Minnesota

(26) Existence theorems for periodic solutions of weakly nonlinear Lipschitzian autonomous differential systems

Professor Lamberto Cesari and Mr. W. R. Fuller, Purdue University

(27) A kernel function of a parabolic differential equation

Professor Hidehiko Yamabe, University of Minnesota

(28) A boundary value problem of diffusion equations

Mr. Seizo Ito, Minneapolis, Minnesota

(Introduced by Professor Hidehiko Yamabe)

(29) On the isolated singularities of solutions of $\Delta u = e^u$

Dr. J. C. C. Nitsche, University of Minnesota

(30) Solution of some linear partial differential equations

Professor H. G. Loomis, Amherst College, and Professor I. M. Sheffer, Pennsylvania State University

(31) Growth of solutions of a certain hyperbolic equation

Mr. R. B. Kellogg, Northwestern University

(32) On the general Schrodinger equation

Dr. R. T. Prosser, Massachusetts Institute of Technology

(33) A formula relating the index and the sectors of a singular point in n-space
Professor Felix Haas, Wayne State University

(34) A global structure theorem for arbitrary dynamical systems in E^n
Dr. R. W. Bass, Princeton University

Session on Applied Mathematics, Electrical Engineering, Room 110

(35) Stability of the continuous medium reactor
Dr. W. K. Ergen, Oak Ridge National Laboratory, and Professor J. A. Nobel, Georgia Institute of Technology

(36) Radiative transfer and measure theory
Dr. R. W. Preisendorfer, Scripps Institute of Oceanography, University of California, San Diego

(37) On the length of the smallest uniform experiment which distinguishes the terminal states of a machine
Dr. Seymour Ginsburg, The National Cash Register Company, Hawthorne, California

(38) Relativistic aspects in classical mechanics
Professor Walter Noll, Carnegie Institute of Technology

(39) On Struik's gravity waves
Dr. Walter Littman, University of California, Berkeley

(40) On some mathematical properties of wedge solutions
Professor Aboghassem Ghaffari, National Bureau of Standards, Washington, D. C. and Teheran University

(41) Integration of heat conduction equations for composite media
Dr. Mark Lotkin, Avco Manufacturing Corporation, Lawrence, Massachusetts

(42) On the Runge-Kutta fourth-order method
Dr. E. K. Blum, The Ramo-Wooldridge Corporation, Los Angeles, California

(43) On a mixed problem for Euler-Poisson-Darboux equation
Dr. H. M. Lieberstein, University of Maryland

Session on Algebra and Theory of Numbers, Sparks Building, Room 316

(44) Scalar polynomial equations for matrices over a finite field
Professor J. H. Hodges, University of Buffalo

(45) On normal matrices
Dr. M. H. Pearl, University of Rochester and National Bureau of Standards, Washington, D. C.

(46) Nilalgebras and linear varieties of nilpotent matrices. II
Professor Murray Gerstenhaber and Mr. S. A. Hoffman, University of Pennsylvania

(47) On Whitehead's second lemma
Professor H. E. Campbell, Michigan State University

(48) Restricted noncommutative Jordan algebras of characteristic p
Professor R. D. Schafer, University of Connecticut

(49) Differentiably simple rings
Dr. E. C. Posner, University of Chicago and Bell Telephone Laboratories, New York, New York

(50) An application of results on the reduction of an algebraic function field to extensions of the field of constants of an algebraic function field
Professor E. D. Nering, University of Arizona

(51) Ulam's axiom and Cartesian products of fields
Dr. Seth Warner, Duke University

Session on Geometry, Sparks Building, Room 228

(52) Curvature and Betti numbers of compact Riemannian manifolds with boundary
Professor C. C. Hsiung, Lehigh University

(53) Closed convex surfaces
Professor V. G. Grove, Michigan State University

(54) Existence of surfaces in a certain conformal correspondence
Professor T. K. Pan, University of Oklahoma

(55) On subsets of the unit sphere which are sufficiently small to be subsets of some hemisphere
Professor D. C. Benson and Professor L. E. Dubins, Carnegie Institute of Technology

(56) Oscillating inequality, Fibonacci sequence, and quadratic transformations
Professor W. R. Hutcherson, University of Florida

(57) Intermittent rotors
Mr. Michael Goldberg, Bureau of Ordnance, U. S. Navy

THURSDAY, 9:00 A.M.

Colloquium Lecture III, Sparks Building, Room 121

Cohomology operations, and obstructions to extending continuous functions (One hour)
Professor N. E. Steenrod, Princeton University

THURSDAY, 10:30 A.M.

Invited Address, Sparks Building, Room 121

Rationality questions on algebraic groups (One hour)
Professor M. A. Rosenlicht, Northwestern University

THURSDAY, 2:00 P.M.

Session on Analysis, Sparks Building, Room 10

(58) Extremal structure of convex sets. I
Professor V. L. Klee, Jr., University of Washington

(59) An intersection property for cones in a linear space
Professor R. E. Fullerton, University of Maryland

(60) Depressing subspaces of a conjugate Banach space
Dr. J. A. Schatz, University of Connecticut, and Professor Albert Wilansky, Lehigh University

(61) An integral over function space
Professor W. F. Eberlein, University of Rochester

(62) Measures on Boolean algebras and abstract (L)-spaces
Professor L. J. Heider, Marquette University

(63) An operator theoretic approach to generalized Fourier transforms
Dr. R. A. Kunze, Massachusetts Institute of Technology

(64) A theorem on Fourier-Stieltjes transforms
Professor C. S. Herz, Cornell University

(65) Integrals defined by abstract L_p spaces
Mr. Hugh Gordon, Columbia University

(66) Weak containment of group representations
Professor J. M. G. Fell, University of Washington

(67) An element of the enveloping algebra of a Lie group
Mr. W. F. Stinespring, University of Chicago

Session on Topology, Sparks Building, Room 316

(68) A note on Kosiński's r-spaces
Professor M. L. Curtis, University of Georgia

(69) Conditions under which a surface in E^3 is tame
Professor R. H. Bing, University of Wisconsin and Institute for Advanced Study

(70) Arcs of homeomorphisms
Professor J. H. Roberts, Duke University

(71) On tree-like continua and irreducibility
Mr. R. H. Rosen, University of Wisconsin

(72) A study of certain plane-like spaces without the use of arcs
Mr. Steve Armentrout, State University of Iowa

(73) The existence of cut sets in totally non-aposyndetic continua
Professor E. E. Grace, Emory University

(74) Chainable continua and indecomposability
Professor C. E. Burgess, University of Wisconsin and University of Utah

(75) Invariants for quasi-compact mappings
Professor W. E. Malbon, University of Virginia

(76) A fixed point theorem for multi-valued functions
Dr. L. E. Ward, Jr., U. S. Naval Ordnance Test Station, China Lake, California

(77) Fixed points from neighborhood retracts
Professor W. L. Strother, University of Miami, and Dr. L. E. Ward, Jr., Naval Ordnance Test Station, China Lake, California

Session on Statistics and Probability, Logic and Foundations, Sparks Building, Room 228

(78) Semimartingales of Markov chains
Professor J. G. Kemeny and Professor J. Laurie Snell, Dartmouth College

(79) An operator identity
Professor G. E. Baxter, University of Minnesota

(80) Sums of powers of independent random variables
Professor J. M. Shapiro, Ohio State University

(81) Expectations for sums of powers
Dr. D. J. Newman, Avco Research and Advanced Development Division, and Professor M. S. Klamkin, Avco Research and Advanced Development Division and Polytechnic Institute of Brooklyn

(82) Random sampling applied to the solutions of systems of linear equations
Professor Valdemars Punga, Rensselaer Polytechnic Institute, Hartford Graduate Center

(83) Asymptotic properties of queueing times when the arrival epochs are arbitrary
Professor Edgar Reich, University of Minnesota

(84) Single-server, time-limited queues
Mr. H. N. Gurk, Radio Corporation of America, Camden, New Jersey

(85) On the existence of finite models and decision procedures for propositional calculi
Dr. Ronald Harrop, King's College, University of Durham

FRIDAY, 9:00 A.M.

Colloquium Lecture IV, Sparks Building, Room 121

Cohomology operations, and obstructions to extending continuous functions (One hour)
Professor N. E. Steenrod, Princeton University

FRIDAY, 10:30 A.M.

Session on Analysis, Sparks Building, Room 10

(86) Continuous products and nonlinear integral equations
Mr. J. W. Neuberger, The University of Texas

(87) Equations of Wiener-Hopf type
Dr. Harold Widom, Cornell University

(88) Upper and lower divergence of vector fields
Professor V. L. Shapiro, Rutgers University

(89) Fourier transform theory for pansions of exponential growth
Professor Jacob Korevaar, University of Wisconsin

(90) On lacunary trigonometric series
Professor Walter Rudin, University of Rochester

(91) Continuous functions as Fourier transforms
Professor Henry Helson, University of California, Berkeley

(92) Subadditive functions in general. Preliminary report
Professor P. C. Hammer, University of Wisconsin

Session on Analysis and Applied Mathematics, Sparks Building, Room 121

(93) Uniform completeness and closure of powers of reciprocals of linear functions
Professor Pasquale Porcelli, Illinois Institute of Technology

(94) Existence of harmonic functions with prescribed singularities
Professor W. C. Fox, Northwestern University

(95) A method for approximating the imaginary roots of analytic equations
Professor Stephen Kulik, University of South Carolina

(96) Inverses of Vandermonde matrices
Dr. Nathaniel Macon and Dr. Abraham Spitzbart, General Electric Company, Evendale, Ohio

(97) The p-color problem: A generalization of the Young-Frankel successive over-relaxation scheme
Dr. R. S. Varga, Westinghouse Atomic Power Division, Pittsburgh, Pennslyvania

(98) On the evaluation of the general bialternant
Mr. Paul Weiss, General Electric Company, Syracuse, New York

(99) A finite algorithm for the linear inequality and Tchebycheff problems
Dr. A. A. Goldstein and Mr. Ward Cheney, Convair-Astronautics, San Diego, California

Session on Algebra and Theory of Numbers, Sparks Building, Room 316

(100) Symmetric random walk on groups
Mr. Harry Kesten, Cornell University

(101) A generalization of Ulm's theorem
Mr. George Kolettis, Jr., Northwestern University

(102) Cross-inverse loops
Dr. Rafael Artzy, Israel Institute of Technology and University of Wisconsin

(103) On some existence theorems in a multiplicative system
Mr. Naoki Kimura, Tulane University and Tokyo Institute of Technology

(104) Representations of semigroups
Professor G. B. Preston, Tulane University

(105) Admissible mobs. I. Preliminary report
Professor H. S. Collins, Louisiana State University

(106) Convexity of the kernel in admissible mobs
Professor Haskell Cohen, Louisiana State University

(107) Characters of mobs. Preliminary report
Mr. N. J. Rothman, Louisiana State University

FRIDAY, 1:30 P.M.

Sessions for Late Papers, Sparks Building

SUPPLEMENTARY PROGRAM
(To be presented by title)

(108) On a theory of Boolean functions
Mr. S. B. Akers, Jr., General Electric Company, Syracuse, New York

(109) Characterizations of certain lattices of functions
Professor F. W. Anderson and Professor R. L. Blair, University of Oregon

(110) Reducible linear differential systems
Dr. H. A. Antosiewicz, National Bureau of Standards, Washington, D. C.

(111) Concerning integrals. Preliminary report
Mr. W. D. L. Appling, University of Texas
(Introduced by Professor H. S. Wall)

(112) Stability of nonlinear control systems. I
Dr. R. W. Bass, Princeton University

(113) $n \times n$ matrices over an AW^*-algebra
Professor S. K. Berberian, Michigan State University

(114) Ergodic projections for periodic Markov chains and processes
Mr. A. T. Bharucha-Reid and Dr. L. W. Anderson, University of Oregon

(115) E^3 does not contain uncountably many mutually exclusive wild surfaces
Professor R. H. Bing, University of Wisconsin and Institute for Advanced Study

(116) Homology of loops of certain H-spaces
Mr. William Browder, Princeton University

(117) Derivations in operator algebras
Professor R. C. Buck, University of Wisconsin

(118) Automorphisms of operator algebras
Professor R. C. Buck, University of Wisconsin

(119) A Stone-Weierstrass theorem for C^*X
Professor R. C. Buck, University of Wisconsin

(120) Generalized functional 'round-off error analysis
Professor J. W. Carr, III, University of Michigan

(121) A class of steady supersonic rotational axial symmetric flows
Professor Nathaniel Coburn, University of Michigan

(122) The characteristic relations in the non-steady flow of a compressible gas. Preliminary report
Professor Nathaniel Coburn, University of Michigan

(123) Representations of even functions (mod r)
Professor Eckford Cohen, University of Tennessee

(124) On the geometry of quaternions
Mr. D. W. Crowe, University of Michigan
(Introduced by Dr. J. S. Griffin)

(125) Stability and convergence for a numerical solution of the Goursat problem
Mr. R. T. Dames, University of Michigan

(126) On extending a theorem to Serre fiber spaces
Professor E. R. Fadell, University of Wisconsin

(127) The entropy of an infinite probability space
Dr. I. B. Fleischer, Brooklyn, New York

(128) On the equivalence of certain algorithms for the generation of continued fraction expansions
Professor Evelyn Frank, University of Illinois and University of California, Los Angeles

(129) Symmetric positive linear differential equations
Professor K. O. Friedrichs, New York University

(130) On uniformizable spaces with a unique structure
Professor I. S. Gál, Cornell University

(131) Asymptotic values for analytic functions of bounded characteristic
Professor F. W. Gehring, University of Michigan

(132) On the Lindelöf theorem
Professor F. W. Gehring and Professor A. J. Lohwater, University of Michigan

(133) Nilalgebras and linear varieties of nilpotent matrices. I
Professor Murray Gerstenhaber, University of Pennsylvania

(134) The spaces L_p for generalized integrals
Mr. Hugh Gordon, Columbia University

(135) Linear systems of first and second order differential systems with periodic coefficients
Mr. J. K. Hale, Remington Rand Univac, St. Paul, Minnesota

(136) On the cohomology of certain loop spaces
Dr. Edward Halpern, University of Michigan

(137) Partial cohomology of modules I abelian groups. Preliminary report
Dr. D. K. Harrison, Brown University

(138) Symmetric Runge-Kutta methods for integrating ordinary differential equations of the first order
Professor Peter Henrici, University of California, Los Angeles

(139) On the error of a method of Hammer and Hollingsworth for integrating ordinary differential equations
Professor Peter Henrici, University of California, Los Angeles

(140) Methods for integrating ordinary differential equations based on Gaussian quadrature
Professor Peter Henrici, University of California, Los Angeles

(141) Some properties of compactifications. II
Professor Melvin Henriksen, Purdue University, and Professor J. R. Isbell, University of Washington

(142) On primary ideals in $C(X)$
Professor J. G. Horne, Jr., University of Kentucky

(143) On 0_ω ideals in $C(X)$
Professor J. G. Horne, Jr., University of Kentucky

(144) On Jordan algebras with two generators
Professor Nathan Jacobson, Yale University, and Professor L. J. Paige, University of California, Los Angeles

(145) Complete asymptotic solutions for ordinary second order linear differential equations with two simple turning points. I
Professor N. D. Kazarinoff, University of Michigan

(146) A fundamental matrix for regular Markov chains
Professor J. G. Kemeny and Professor J. Laurie Snell, Dartmouth College

(147) Two-point procedures for the numerical solution of systems of equations
Dr. W. M. Kincaid, University of Michigan

(148) Locally o-convex spaces. I
Dr. J. E. Kist, Purdue University

(149) Locally o-convex spaces. II
Dr. J. E. Kist, Purdue University

(150) Recursive functionals and quantifiers of finite types. I
Professor S. C. Kleene, University of Wisconsin

(151) Some nodal noncommutative Jordan algebras
Professor L. A. Kokoris, Washington University and Yale University

(152) Local characterization of Fourier transforms
Professor Jacob Korevaar, University of Wisconsin

(153) Completeness theorems for sets of translates as cancellation theorems
Professor Jacob Korevaar, University of Wisconsin

(154) Fourier transforms and the linear harmonic oscillator
Professor Jacob Korevaar, University of Wisconsin

(155) Hermite expansions
Professor Jacob Korevaar, University of Wisconsin

(156) Pansions
Professor Jacob Korevaar, University of Wisconsin

(157) Fourier transforms of pansions
Professor Jacob Korevaar, University of Wisconsin

(158) Fourier transform theory for pansions of polynomial growth
Professor Jacob Korevaar, University of Wisconsin

(159) On relaxation oscillations
Professor E. O. A. Kreyszig, Ohio State University

(160) On Weyl's inequality for eigenvalues
Dr. Joseph Lehner and Dr. G. M. Wing, Los Alamos Scientific Laboratory, Los Alamos, New Mexico

(161) On integration theory
Professor E. R. Lorch, Columbia University

(162) On the concept of the strict radical. Preliminary report
Dr. Edith H. Luchins, University of Oregon

(163) On continuity of homomorphisms into Banach algebras. Preliminary report
Dr. Edith H. Luchins, University of Oregon

(164) On special Horn sentences
Professor R. C. Lyndon, University of Michigan

(165) On subdirect products of relational systems
Professor R. C. Lyndon, University of Michigan

(166) Concerning quasi-harmonic operators
Professor J. S. MacNerney, University of North Carolina

(167) Some extreme value results for indefinite Hermitian matrices. II
Professor M. D. Marcus, Professor B. N. Moyls and Mr. Roy Westwick, University of British Columbia

(168) The monodromic group and the Picard-Vessiot theory. Preliminary report
Professor Anthony Mardellis, Long Beach State College

(169) An extension of Gödel's incompleteness theorem
Professor Richard Montague, University of California, Los Angeles

(170) Discontinuities in the solutions of degenerate parabolic equations
Dr. J. C. C. Nitsche, University of Minnesota

(171) Lie algebras of alternating forms
Professor H. A. Osborn, University of Illinois

(172) Convex sets and closest points
Mr. R. R. Phelps, University of Washington

(173) On the Schrodinger equation of quantum electrodynamics
Dr. R. T. Prosser, Massachusetts Institute of Technology

(174) The optimum linear program
Professor I. F. Ritter, New York University

(175) A new proof of a theorem of Lehmer
Professor J. B. Roberts, Reed College

(176) Some classes of orthogonal functions
Professor J. B. Roberts, Reed College

(177) Tensor products of semiprimary algebras
Professor Alex Rosenberg and Professor Daniel Zelinsky, Institute for Advanced Study

(178) Perfect subsets of compact spaces
Professor Walter Rudin, University of Rochester

(179) Factorization in group algebras
Professor Walter Rudin, University of Rochester

(180) Discrete flows on compact spaces
Professor Walter Rudin, University of Rochester

(181) Formulas for hyperosculatory interpolation, direct and inverse
Dr. H. E. Salzer, Convair-Astronautics, San Diego, California

(182) A note to Poincare's perturbation method
Professor Jane C. Scanlon, Polytechnic Institute of Brooklyn

(183) On noncommutative Jordan algebras
Professor R. D. Schafer, University of Connecticut

(184) Negligible sets for the divergence theorem
Professor V. L. Shapiro, Rutgers University

(185) q-Bernoulli numbers and Euler numbers of higher order
Professor Ambikeshwar Sharma, Cornell University

(186) A generalization of Hermite's interpolation formula
Dr. Abraham Spitzbart, General Electric Company, Evendale, Ohio

(187) Multiple Fourier analysis in rectifier problems
Dr. R. L. Sternberg, Miss L. Shirley Rose, Laboratory for Electronics, Inc., Boston, Massachusetts, and Mr. J. S. Shipman, Radio Corporation of America, Waltham, Massachusetts

(188) Rings on analytic functions
Professor John Wermer, Brown University

(189) Polynomial approximation on curves
Professor John Wermer, Brown University

R. D. Schafer
Associate Secretary

Storrs, Connecticut
July 12, 1957

PRELIMINARY ANNOUNCEMENT OF MEETING

FIVE HUNDRED THIRTY-EIGHTH MEETING

Washington, D. C.
October 26, 1957

The five hundred thirty-eighth meeting of the American Mathematical Society will be held at the National Bureau of Standards, Washington, D. C. on Saturday, October 26, 1957. *All times given below are Eastern Daylight Saving Time* (Washington, D. C., returning to Eastern Standard Time at 2:00 A.M., Sunday, October 27).

By invitation of the Committee to Select Hour Speakers for Eastern Sectional Meetings, Professor W. H. Gottschalk of the University of Pennsylvania will give an hour address entitled *Minimal sets: an introduction to topological dynamics* at 2:00 P.M. in the East Building Lecture Hall.

There will be sessions for contributed papers at 10:00 A.M. and 3:15 P.M.

A registration desk will be maintained on the fourth floor of the East Building, in the hallway approaching the East Lecture Hall. Maps of the Bureau grounds and a list of nearby restaurants will be available at the registration desk.

The National Bureau of Standards is located at Connecticut Avenue and Van Ness Streets, N. W., in the northwest part of the city. The entrance gate at this location is the most convenient; on Saturday other gates are closed. The Bureau is accessible by automobile via Alternate D. C.-U. S. Route 240 along Connecticut Avenue or via Route 240 along Wisconsin Avenue to Van Ness Street, by Capital Transit bus L2 or L4 along Connecticut Avenue, or by taxicab. It is about a 20-minute taxicab ride from Union Station in downtown Washington or about a 30-minute ride from National Airport. Directions for approaching the East Building may be obtained at the Bureau Guard Office on Van Ness Street near Connecticut Avenue. A parking area is located near the East Building; additional parking space is available along Van Ness Street.

Further details of the meeting will appear in the next issue of the *Notices*. Abstracts of contributed papers should be sent to the American Mathematical Society, 190 Hope Street, Providence 6, Rhode Island, so as to arrive NOT LATER THAN THE DEADLINE, September 12.

Richard D. Schafer
Associate Secretary

Storrs, Connecticut
July 12, 1957

ACTIVITIES OF OTHER ASSOCIATIONS

THE INTERNATIONAL MATHEMATICAL UNION. The following information has been received concerning the activities of the IMU.

1. The applications of Hungary, Bulgaria, and Czechoslovakia for membership in the IMU have been unanimously approved by the voting nations. The memberships all became effective on May 21, 1957. The national committees are as follows:

Bulgaria: Lubomir Tschakalov, Nikola Obreschkov, and Kyrill Popov.

Czechoslovakia: Otakav Borurka, Vojtech Jarnik, Miroslav Katetov, Stefan Schwarz, and Eduard Cech, Chairman.

Hungary: Cyorgy Alexitz, Jeno Egervary, Paul Erdös, Lipot Fejer, Tibor Gallai, Gyorgy Hajos, Karoly Jordan, Laszlo Kalmer, Laszlo Redai, Alfred Rényi, Janos Suranyi, Bela Szokofalvi-Nagy, Pal Turan, Otto Varga.

It is also announced that the National Committee of the U. S. S. R. consists of: P. S. Alexandroff, N. N. Bogoljuboff, M. A. Lawrantjeff, S. L. Soboljeff, and J. M. Vinogradoff, Chairman.

2. The Adhering Organizations are kindly requested to use for all financial matters in connection with the IMU one of the banks listed below:

Crédit Suisse	Chase Manhattan Bank	Société Générale
Agence Rigiplatz	18 Pine Street	29 Boulevard Haussmann
Zürich 33	New York 15, New York	Paris IXe
Switzerland	U. S. A.	France

The former bank account in Rome has been discontinued.

INTERNATIONAL MATHEMATICAL UNION LECTURES. The Executive Committee of the IMU, in considering the advantages of various types of new Union activities, has been interested in the possibility of a regular program of travel grants to IMU lecturers. To test the practicality of a long range program of such grants, the Executive Committee has voted to carry on a small trial program during the period November 1957 to July 1958. This program is intended to encourage lectures by visiting mathematicians from other countries, by providing grants to supplement local funds available for the travel expenses of the lecturers.

Such IMU lecturers are expected to be mathematicians from one country who are invited to give a substantial series of lectures by an institution in another (and usually quite distant) country. The institution issuing the invitation may be a university, a group of universities, an academy or the like, all located in a country which is a member of the IMU.

This inviting institution shall choose the prospective lecturer, obtain preliminary assurances of his availability, and consult the National Committee for Mathematics in its own country as to these plans. The inviting institution then submits a formal application to the Secretariat of the IMU.

This application should state the detailed plan for the intended series of lectures (the name of the lecturer, his subject, the number of lectures, the dates and place of these lectures). There should be added available information about the mathematical content of the lectures – for example, the size and interests of the expected audience, and possible previous experience with visiting lecturers. The application should state that the inviting institution has consulted the National Committee in its own country. Finally, the application should specify the amount of IMU travel funds requested and the amounts available from other sources for this travel. In this trial program each IMU grant must be matched by at least an equal amount from other sources. Further information can be obtained from the Secretary of the Union.

Applications are due on or before September 15, 1957 in the office of the Secretariat, International Mathematical Union, École Polytechnique Fédérale, Zürich, Suisse. They will be studied by a subcommittee of the IMU commission on Exchanges, and awards will be announced by October 15, 1957.

INTERNATIONAL CONGRESS OF MATHEMATICIANS, 1962. In accordance with the practice established at the International Congress of Mathematicians in 1954, a joint committee consisting of representatives of the organizing committee of the International Congress to be held in Edinburgh in 1958 and of representatives of the IMU has been appointed to discuss the location of the International Congress of 1962 and to prepare a proposition to be presented to the Congress in Edinburgh in 1958.

This committee requests that any national body which wishes to invite the Congress to meet in its country should inform the Secretary of the International Mathematical Union (Professor B. Eckmann, École Polytechnique Fédérale, Zürich, Switzerland) of its intentions as soon as possible, and by February 15, 1958 at the latest. It would greatly help the committee to reach its decision if prospective hosts would supply as much information as possible about their plans for the Congress when notifying their intention. The committee will be pleased to answer any queries and to give such advice as it can on any matters concerning the organization of the Congress to any country who asks for it.

THE INTERNATIONAL COMMISSION ON MATHEMATICAL INSTRUCTION. This Commission is holding a meeting in Brussells, Belgium, in July, 1957, to plan for the Commission Program at the Edinburgh International Congress. The following subcommittee of the U. S. National Committee provides for liaison with the Commission: C. B. Allendoerfer, S. S. Cairns, Howard Fehr, Henry Syer, and J. G. Kemeny, Chairman.

A MEETING OF THE U. S. NATIONAL COMMITTEE. The U. S. National Committee held a one-day meeting in Princeton, New Jersey, on February 2, 1957. Among the subjects discussed were: A possible international study of the economic status of mathematicians, early formation of the International Committee on the location of the 1962 International Congress, a possible expository journal to be published by the Union, and the possibility of holding on an international scale institutes like the five or six week summer institutes held by the American Mathematical Society in the United States. In addition, the meeting discussed the possibility that increasing size has reduced the effectiveness of the International Congresses. It was the general sentiment that the IMU was the proper body to consider a program of modernizing International Congresses by means such as: (a) Discarding altogether the 10 or 15-minute papers, (b) Introducing more and better expository talks, and (c) Decreasing the length and number of sessions. The National Committee (Saunders MacLane, Chairman) welcomes comments and suggestions on the nature of the International Congresses.

THE EXECUTIVE COMMITTEE OF THE IMU now consists of Heinz Hopf, President; Arnold Denjoy and W. V. D. Hodge, Vice Presidents; Beno Eckmann, Secretary; J. F. Koksma, K. Chandrasekharan, and Saunders MacLane, members.

THE 38TH SUMMER MEETING OF THE MATHEMATICAL ASSOCIATION OF AMERICA. The thirty-eighth summer meeting of the Mathematical Association of America will be held at Pennsylvania State University, University Park, Pennsylvania, from Monday, August 26 to Thursday, August 29, 1957, in conjunction with the summer meetings of the American Mathematical Society, the Society for Industrial and Applied Mathematics, and the Pi Mu Epsilon Fraternity.

Sessions of the Mathematical Association will be held on Monday at 9:00 A.M. and 2:00 P.M., on Tuesday at 9:00 A.M. and on Wednesday and Thursday at 2:00 P.M. All sessions will be held in 121 Sparks Building. At the first three sessions, the sixth series of Earle Raymond Hedrick Lectures will be delivered by Professor Leo Zippin of Queens College

on the topic of *Topological Transformation Groups*. The lecture by Professor Edrei on Monday morning will be presented on closed circuit television. The sessions on Wednesday and Thursday are open meetings of the Association's Committee on the Undergraduate Program in Mathematics.

The Board of Governors of the Association will meet on Monday evening at 7:30 in the Beta Theta Pi fraternity house.

A meeting of officers of the Sections of the Association will be held on Tuesday evening at 7:30 in the Hetzel Union Building, second floor.

First Session, Monday: 9:00 A.M., 121 Sparks Building

The Earle Raymond Hedrick Lectures: Topological Transformation Groups; Lecture I
Professor Leo Zippin, Queens College

Elementary Problems in the Theory of Entire Functions
Professor Albert Edrei, Syracuse University

Intersection Properties of Convex Sets
Professor V. L. Klee, Jr., University of Washington

Second Session, Monday: 2:00 P.M., 121 Sparks Building

The Earle Raymond Hedrick Lectures: Topological Transformation Groups; Lecture II
Professor Leo Zippin, Queens College

The Science Teaching Improvement Program
Dr. J. R. Mayor, Director, Science Teaching Improvement Program, AAAS

A Special Program for Gifted Undergraduates
Professor K. O. May, Carleton College

Third Session, Tuesday: 9:00 A.M., 121 Sparks Building

The Earle Raymond Hedrick Lectures: Topological Transformation Groups; Lecture III
Professor Leo Zippin, Queens College

Business Meeting of the Association

Survey of Research Potential and Training in the Mathematical Sciences
Professor J. W. Green, University of California, Los Angeles

Mathematicians in Industry and Government
Dean Mina S. Rees, Hunter College

Fourth Session, Wednesday: 2:00 P.M., 121 Sparks Building

Teaching Statistical Inference in Elementary Mathematics Courses
Professor S. S. Wilks, Princeton University

Symposium: Probability and Statistics in Undergraduate Mathematics

Introduction: Professor M. E. Munroe, University of Illinois

Moderator: Dr. Brockway McMillan, Bell Telephone Laboratories

Symposium: The Study of Logic and Foundations in Undergraduate Courses

Introduction: Professor P. R. Halmos, University of Chicago

Moderator: Professor J. G. Kemeny, Dartmouth College

Fifth Session, Thursday: 2:00 P.M., 121 Sparks Building

The Work of the Committee on the Undergraduate Program in Mathematics: C.U.P. Books and Commercial Texts

Professor R. L. Davis, University of Virginia

The C.U.P. Program

Professor J. G. Kemeny, Dartmouth College

Symposium: Goals of Freshman Courses

Introduction: Professor K. O. May, Carleton College

Moderator: Professor G. B. Price, University of Kansas

Symposium: Calculus for Freshmen

Introduction: Professor R. V. Andree, University of Oklahoma

Moderator: Professor W. L. Duren, Jr., University of Virginia

THE SUMMER MEETING OF THE SOCIETY FOR INDUSTRIAL AND APPLIED MATHEMATICS. The Society for Industrial and Applied Mathematics will hold its meeting August 26–27, 1957, at University Park, Pennsylvania.

Monday 7:30 P.M. – 312 Sparks Building

Session on Contributed Papers

(1) *A survey of methods of inverting matrices and solving systems of simultaneous linear algebraic equations*

G. R. Trimble, Jr., Computer Usage Company, Incorporated

(2) *On smoothing a finite table: a matrix approach*

T. E. Greville, Social Security Administration

(3) *A solution method for the transportation problem*

Murray Gerstenhaber, University of Pennsylvania and Remington Rand UNIVAC

Tuesday 9:00 A.M. – 228 Sparks Building

Open Council Meeting

3:15 P.M. – 110 Electrical Engineering Building

Invited Lecture (One hour)

The present theory of Turing machine computability

Professor Hartley Rogers, Jr., Massachusetts Institute of Technology

4:30 P.M. – 110 Electrical Engineering Building

Session on Contributed Papers

(4) *On an approximate solution of a certain boundary-value proble*
L. I. Mishoe, Morgan State College

(5) *Estimated probabilities from finite samples of stationary random variables*
J. L. Lumley, Johns Hopkins University

(6) *Optimal stockpile procedure*
G. H. Weiss, Naval Ordnance Laboratory

7:30 P.M. – 110 Electrical Engineering Building

Invited Lecture (One hour)

Mathematical problems in reactor theory
Dr. Robert Charpie, Oak Ridge National Laboratory

9:00 P.M. Beer Party (place to be announced)

THE SUMMER MEETING OF THE PI MU EPSILON FRATERNITY. The Pi Mu Epsilon Fraternity will hold its meeting on August 26–27, 1957, at University Park, Pennsylvania.

Monday, August 26

5:30 P.M.–7:00 P.M. Supper meeting of the National Pi Mu Epsilon Council, 127 Waring Hall. Both old and new council members are urged to attend.

7:00 P.M.–8:30 P.M. Program of selected papers by student members of Pi Mu Epsilon. 228 Sparks Building.

Tuesday, August 27

3:30 P.M. Selected papers by members. 228 Sparks Building

THE FOURTH NATIONAL SYMPOSIUM ON RELIABILITY AND QUALITY CONTROL will be held January 6, 7, and 8, 1958, at the Hotel Statler in Washington, D. C. This Symposium is sponsored by the Institute of Radio Engineers, the American Institute of Electrical Engineers, the American Society for Quality Control, and the Radio Electronic Television Manufacturers' Association.

THE ANNUAL MEETING OF THE AMERICAN STATISTICAL ASSOCIATION will be held on September 10–13, 1957, at the Ambassador Hotel in Atlantic City, New Jersey. The meeting will be held in conjunction with various other societies, including the Econometric Society. All of the sessions of the American Statistical Association will be held at the Ambassador Hotel, and arrangements have been made for reduced convention rates for those electing to stay at this hotel. There will be commer-

cial and Government exhibits at the hotel. Arrangements have been made with the U. S. Employment Service and the New Jersey State Employment Service to operate an employment office in connection with the meeting.

"RÉUNION DES MATHÉMATICIENS D'EXPRESSION LATINE". This event will be held under the sponsorship of the Italian Mathematical Union and the French Mathematical Society, with support from the French Government and the municipality of Nice. It will take place on September 12–19, 1957, at the Mediterranean University Center of Nice.

The event will center around 9 conferences which will be devoted to topics selected from the following fields: Differential Geometry and Topology, Algebra and Algebraic Geometry, Partial Differential Equations, and Probability and Mathematical Physics. It is expected that there will be extensive discussions in connection with each of the conferences. The leaders of the conferences will be MM. *José Adem, B. Eckmann, F.* Gaeta, P. Gillis, M. L'Abbé, C. Miranda, B. Segre, S. Stoïlow, and M. Zaluar-Nunes.

Mathematicians who desire to participate in this event are asked to get in touch with the Secretariat as soon as possible. The address of the Secretariat, until July 31, is: Réunion des Mathématiciens d'Expression Latine, Société Mathématique de France, 11 rue Pierre Curie, Paris 5e. The Secretariat from August 1 – September 19 is: Réunion des Mathématiciens d'Expression latine, Centre Universitaire Méditerranéen, 65 Promenade des Anglais, Nice (Alpes Maritimes). A registration fee of 1000 francs per person will be assessed. Checks should be made out to the Société Mathématique de France.

THE MATHEMATICS DIVISION OF THE AMERICAN SOCIETY FOR ENGINEERING EDUCATION met on June 17–21, 1957 at Cornell University. Three well-attended sessions were held, including a joint conference with the Upper New York State Section of the Mathematical Association of America. The following new officers of the Division were elected at the annual business meeting: Chairman, Clarence R. Wylie, University of Utah; Vice-Chairman, Horace A. Giddings, New York University; Secretary, William E. Restemeyer, University of Cincinnati; Directors, Walter G. Warnock, Rensselaer Polytechnic Institute, George B. Thomas, Massachusetts Institute of Technology, Cletus O. Oakley, Haverford College; Representative to ASEE General Council, Haim Reingold, Illinois Institute of Technology. The next annual meeting of the Mathematics Division will be held in June, 1958 at Berkeley, California. For further information write to Professor William E. Restemeyer, University of Cincinnati.

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS has announced that Oscar B. Schier, II, has been designated Secretary-Elect. He will succeed Clarence E. Davies who will retire as Secretary after 23 years of service in this office. The post of Secretary is the chief administrative office of the 50,000-member Society.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. The following information has been received as to future and past activities of the American Association for the Advancement of Science (AAAS):

The annual meeting of the AAAS for the year 1957 will be held on 26–31 December, in Indianapolis. This will be the 124th national meeting of the AAAS. It will be the Association's first meeting in the Midwest in 5 years. Many of the sessions and exhibits will be held in the Murat Temple. The Claypool Hotel will serve as the AAAS Headquarters. The Mathematics Section, Section A, under the Chairmanship of C. C. MacDuffee of the University of Wisconsin, will sponsor an important symposium on the teaching of mathematics, to be arranged by John R. Mayor, Director, AAAS Science Teaching Improvement Program. The symposium will be co-sponsored by the association as a whole and by the AAAS Cooperative Committee on the Teaching of Science and Mathematics. A session for invited and contributed papers on the mathematics of guided missiles is scheduled for December 28 and the vice presidential address will be given by Dean Mina Rees of Hunter College. The recently affiliated Association for Computing Machinery will hold one of its two annual national meetings with the AAAS in Indianapolis.

TWO AAAS CONFERENCES ON MATHEMATICS INSTRUCTION. During the academic year 1956–57, the AAAS held two conferences on mathematics instruction. Each lasted two days. Both conferences were made possible by a grant to the AAAS from the Carnegie Corporation of New York. The first conference, held in October, 1956, was called because of the interest of scientists in the teaching of mathematics, and, in particular, in current activities directed toward the improvement of instruction at all levels. Participants included representatives of the major scientific societies, including mathematical societies, and teachers of mathematics from colleges and secondary schools. A report on the first conference was published in *SCIENCE* for December 14, 1956.

Dean W. L. Duren presided at the second conference, which was held May 13–14, 1957, and which was called at the request of the Policy Committee on Mathematics. The recommendations which were approved directed attention to possible new activities which were believed could

strengthen mathematics instruction. A report on the second conference will appear in an early issue of *SCIENCE*, but because many readers of the *NOTICES* will be interested in the actions taken by this conference, it has seemed worth while to print the recommendations here in full.

The second conference approved 19 motions in the form of recommendations or resolutions. While all the motions are of general interest to scientists, motions Nos. 1, 2, and 3 are addressed particularly to the State Departments of Education; those numbered 4, 5, and 6, are addressed to mathematicians; those numbered 7, 8, and 9 to the Policy Committee on Mathematics; No. 10 to the Mathematical Association of America (MAA); Nos. 11 and 12 to the National Council of Teachers of Mathematics (NCTM); Nos. 13 and 14 to the American Association for the Advancement of Science (AAAS); and the remaining to the National Science Foundation (NSF). The motions are as follows:

1. That this Conference call the attention of school authorities on state and local levels to the fact that there is at present widespread interest in the improvement of mathematical instruction and that there are significant programs of discussion, activity and experimentation in the area of curricular revision in mathematics presently in progress; and that the Conference recommends that these interests and activities be recognized by the appointment of committees or study groups on the state and local level to consider these problems, and especially to familiarize themselves and their constituencies with the studies of and to determine the applicability to the state or local situations of the findings and recommendations of these groups.

2. That this Conference recommend that states provide supervisory service for elementary and secondary mathematical programs by a person or persons of recognized competence in mathematics.

3. That this Conference request that the Director of Science Teaching Improvement Program send resolutions 1 and 2 to state superintendents of education, and also further publicize them in appropriate journals.

4. That this Conference recommend to college and university departments of mathematics that they offer courses planned for prospective and in-service elementary teachers, and that departments of mathematics seek the cooperation of their education departments to the end that such courses be required of elementary teachers.

5. In view of the current interest in the improvement of mathematics curricula, and the importance to this country of improved mathematical training in the schools, this Conference urges that more mathematicians devote a fraction of their time, when so requested, to meeting with and assisting teachers who are planning and putting into effect such im-

proved courses.

6. That this Conference call attention to the need for additional study, involving mathematicians, of mathematics programs grades 1 to 8.

7. That this Conference recommend that the Policy Committee for Mathematics consider the question of minimum certification requirements for teachers of mathematics.

8. That this Conference recommend that the Policy Committee for Mathematics prepare and distribute in large numbers two 1 or 2 page leaflets: one on careers in teaching mathematics, and one on other careers in mathematics.

9. That this Conference refer to the Policy Committee for Mathematics the question of support for legislation to build mathematics buildings in colleges and universities.

10. That this Conference recommend to the MAA that they take steps in cooperation with NCTM, to extend the visiting lecturer program to high schools.

11. That this Conference refer to NCTM the question of preparing a guide for curriculum studies in mathematics, for the use of city and county school systems, and state groups. The guide would point out ways in which curriculums in mathematics can be developed to meet current needs and take advantage of the national interest in the improvement of mathematics instruction at all levels.

12. That this Conference endorse the curriculum study of the NCTM.

13. Whereas significant efforts have been made to recruit students for such professions as engineering and to enroll in courses in sciences and mathematics, and whereas such efforts have greatly increased the demand for instruction in mathematics, and whereas no comparable efforts have been made to recruit an adequate supply of qualified teachers of mathematics to offer such instruction, be it resolved that this Conference urge that the Science Teaching Improvement Program of the AAAS continue to undertake to secure funds and direction for a program to encourage students in junior and senior high schools and in colleges to enter the profession of the teaching of mathematics.

14. That this Conference recommend that AAAS sponsor a conference in which the mathematical organizations would meet with scientists and engineers to learn what mathematics courses would best support new science.

15. That this Conference recommend to NSF that the Science Faculty Fellowship Program be extended to the high-school level.

16. That this Conference recommend to the NSF that there be more summer institutes programmed for junior high school teachers; and that it publicize this recommendation among colleges which might hold such institutes.

17. That this Conference recommend that NSF consider follow-up of some summer institutes by consulting service; and that they instruct such institutes to try, when possible, to get two or more teachers from the same school system.

18. That this Conference go on record in favor of increasing the number of summer institutes for college teachers of mathematics.

19. That this Conference recommend that NSF consider experimental institutes in mathematics for elementary teachers.

NEWS ITEMS AND ANNOUNCEMENTS

POSTDOCTORAL FELLOWSHIPS OF THE NATIONAL SCIENCE FOUNDATION. Applications will be accepted through September 3, 1957, by the National Science Foundation for a second group of postdoctoral fellowships to be awarded during 1957, both in the Senior postdoctoral and regular postdoctoral programs. Names of successful fellowship candidates will be announced on October 16 and 17, 1957. The fields in which the fellowships are to be awarded include mathematical and physical sciences and certain interdisciplinary fields, and areas of convergence between the natural and social sciences.

To be eligible for these awards, candidates must be citizens of the United States, must have special aptitude for advanced training, and must hold the doctoral degree or have the equivalent in training or experience. In addition, candidates for the Senior postdoctoral program must have at least five years' experience beyond the science doctorate.

Fellows will be selected on the basis of ability as evidenced by letters of recommendation and other evidence of attainment. Candidates' qualifications will be evaluated by carefully chosen panels of scientists under arrangements made by the National Academy of Sciences. Final selection of Fellows will be made by the National Science Foundation. Annual stipends to a maximum of $10,000, adjusted to match as closely as feasible the regular salaries of the award recipients, will be awarded under the Senior program, and the recipients of these awards will engage in study or research in an accredited nonprofit institution of higher learning in the United States or abroad. A limited allowance to aid in defraying costs of travel for a Fellow and his dependents will also be available.

A stipend of $3,800 per year will be awarded to each successful applicant in the regular postdoctoral program. Dependency allowances will be made to married Fellows. A limited allowance to aid in defraying a Fellow's cost of travel will be paid as well as tuition and fees.

Applications and further details concerning the Senior postdoctoral program may be obtained from the Division of Scientific Personnel and Education, National Science Foundation, Washington 25, D. C.

Applications for the regular postdoctoral fellowships may be obtained by writing to the National Academy of Sciences–National Research Council, 2101 Constitution Avenue, N. W., Washington 25, D. C.

SCIENCE FACULTY FELLOWSHIPS OF THE NATIONAL SCIENCE FOUNDATION. The National Science Foundation has announced that applications are being accepted after June 10, 1957, for a second group

of Science Faculty fellowship awards to be made in this calendar year. The closing date for receipt of applications is September 3, 1957. The fellowships are offered as a means of improving the teaching of science, mathematics, and engineering in American colleges and universities. The primary purpose of these awards is to provide an opportunity for college and university science teachers to enhance their effectiveness as teachers. The fields in which the fellowships are offered include the mathematical and physical sciences and certain interdisciplinary fields. Approximately 60 fellowship awards will be made on October 18, 1957.

Science Faculty fellowships are open to application to any citizen of the United States who holds a baccalaureate degree or its equivalent, has demonstrated ability and special aptitude for science teaching and advanced training, has taught at the collegiate level as a full-time faculty member for not less than three years, and intends to continue teaching.

Stipends are individually computed in such a way as to match as closely as possible the regular salary of recipients. In the event that a recipient has supplemental support during his tenure, the amount of his award will be reduced accordingly. The Foundation's award will be adjusted so that the combined support to an individual from the Foundation and other sources will not exceed $10,000 per annum. Additional allowances will normally be made to assist in defraying costs of travel and certain other expenses associated with the fellowship study. Full tuition will be paid for Fellows by the Foundation. Fellows may study at any accredited nonprofit institution of higher education in the United States or similar institutions abroad approved by the Foundation. Tenures of three to fifteen months are available.

Selection will be based on letters of recommendation, academic records, and other appropriate evidences of professional activity and competence. Applicants' qualifications will be evaluated by panels of persons especially competent to make judgments as to the demonstrated and potential ability of an applicant as a teacher of science.

Application materials may be obtained from the Division of Scientific Personnel and Education, National Science Foundation, Washington 25, D. C. Completed materials must be received not later than September 3, 1957, and selections will be announced on October 18, 1957.

THE AMERICAN ASSOCIATION OF UNIVERSITY WOMEN ANNOUNCES FELLOWSHIPS FOR WOMEN. This association has announced that one national fellowship with a stipend of $4,000, two with stipends of $3,500, five with stipends of $3,000, ten with stipends of $2,500, and

twenty to twenty-five with stipends of $2,000, will be awarded for the academic year 1958–1959. In addition to these fellowships, the Committee on Fellowship Awards has at its disposal several sums ranging from $250 to $500 to be used to supplement stipends which may be insufficient for the purpose for which an award is made. These funds are not subject to special application, but may be assigned by the Committee on Awards as needed.

The AAUW also offers for award for 1958–1959 a number of international fellowships, with stipends each of $2,000, for which American women may apply.

Both national and international fellowships are unrestricted as to field and place of study, except that the international fellowship must of course be used in a country other than the candidate's own. The minimum requirement for both national and international fellowships is that candidates must have completed the residence requirements for the doctorate before the fellowship year begins on July 1, 1958.

Awards are also offered for post-doctoral research.

The deadline for applications is December 15, 1957. Successful candidates will be notified not later than March 1, 1958. Application forms may be obtained from Miss Mary H. Smith, Associate, AAUW Fellowship Program, 1634 Eye Street, N. W., Washington 6, D. C.

IN-SERVICE INSTITUTES FOR HIGH SCHOOL TEACHERS SPONSORED BY THE NATIONAL SCIENCE FOUNDATION. Grants totaling $138,000 have been awarded by the National Science Foundation to 18 colleges and universities in the United States and its territories to support in-service institutes designed to improve the training of high-school teachers of science and mathematics.

In-service institutes will begin in the Fall of 1957 and will run through the academic year 1957–1958. Each will offer special courses in the subject matter of science or mathematics especially designed for the needs of high school teachers. Institutes will be held in the evenings and on weekends in order that teachers may attend them outside regular teaching hours. Travel expenses, tuition, and fees for each participant will be covered by the grant from the National Science Foundation. Participants in each institute will be selected from high-school teachers within a radius of some 50 miles of the host institution.

This program is an experimental extension of the current programs of summer and academic-year institutes for high-school teachers sponsored by the National Science Foundation. The high degree of teacher interest in such work is indicated by the fact that there were more than 25,000 ap-

plications for some 5,000 openings in the 1957 summer and academic-year institute programs.

In-service institutes in mathematics will be held at the following colleges and universities during the academic year 1957–1958: Antioch College, Yellow Springs, Ohio, under the direction of Dr. James F. Corwin, Department of Chemistry; Ball State Teachers College, Muncie, Indiana, under the direction of Dr. Charles Brumfiel, Department of Mathematics; Brown University, Providence 12, Rhode Island, under the direction of Dean R. B. Lindsay of the Graduate School; Emory University, Emory University, Georgia, under the direction of Professor Floyd Jordan; Hampton Institute, Hampton, Virginia, under the direction of Dr. Frederick D. Inge, Chairman, Department of Natural Science; New York University, New York 3, New York, under the direction of Professor Frederick W. John, Chairman, Department of Mathematics, Washington Square College; Reed College, Portland 2, Oregon, under the direction of Dr. Arthur F. Scott, Department of Chemistry.

In the case of some of the institutes listed above, the fields of study include other topics as well as mathematics.

All inquiries concerning admission to any institute should be sent to the director of the institute, NOT to the National Science Foundation.

TENTATIVE PROGRAM OF THE CONFERENCE ON MATRIX COMPUTATIONS, to be held at Wayne State University on September 3–6, 1957. An announcement of this conference appeared in the June, 1957, issue of the *NOTICES*. The registration commences at 1:00 P.M., Tuesday, September 3, 1957, in the east lounge on the first floor of Science Hall of Wayne State University. There is no registration fee. No separate publication of the proceedings of the Conference is planned. A summary of the tentative program is as follows:

On Tuesday, September 3, after introductory remarks by Wallace Givens, A. S. Householder will give an hour-long survey of closed methods of inverting matrices. This will be followed by papers entitled *On modern iteration processes of Bernoulli and Graeffe type* by F. L. Bauer of Munich, Germany, and *The rate of convergence of the extrapolated Gauss-Seidel iteration* by William Kahan, University of Toronto. The final paper is entitled *Some suggested extensions to matrix theory* and will be given by William Orchard-Hays, Council for Industry and Economic Research, Incorporated.

On Wednesday, September 4, in the morning Cornelius Lanczos of Dublin Institute for Advanced Studies will present an address entitled *Iterative solution of linear systems*, and Magnus Hestenes of the Uni-

versity of California at Los Angeles will present a paper entitled *Matrix inversion by biorthogonalization.* Also L. Collatz of the University of Hamburg will present a paper entitled *Computation of matrix eigenvalues by methods of functional analysis.* In the afternoon there will be a session on the *Solution of partial differential equations* at which the speakers will be Herbert B. Keller, Edith S. Windsor, Jack Heller, Michael Held, and David Lubell, all of New York University. The afternoon session will also contain a report of a survey on matrix codes by John W. Carr, III, of the University of Michigan and a panel discussion of *Solution of linear equations and inversion of matrices.*

On Thursday, September 5, in the morning, A. M. Ostrowski of the University of Basel, will present a paper entitled *Rayleigh-quotient iteration and computation of characteristic values.* Also George E. Forsythe of Stanford University will present a paper entitled *Generation and use of orthogonal polynomials for data fitting with a digital computer.* Thereafter, R. S. Varga of Westinghouse Electric Corporation, will present a paper entitled *Numerical solution of multigroup diffusion problems* and H. Wittmeyer of Linköping, Sweden will present a paper entitled *A new procedure for developing simple formulae for the eigenvalues of ordinary self-adjoint differential equations.* In the afternoon there will be a session on machine methods to which contributors will be H. Bottenbruch of Darmstadt, Germany, R. Causey, W. Frank, R. Gregory, E. Osborne, I. Tarnove, and D. Young.

At 6:30 P.M. there will be a dinner at the Engineering Society of Detroit, Rackham Building. After dinner, in the small lecture hall of the Engineering Society, J. H. Wilkinson of the National Physical Laboratory Teddington, England will speak on *An outline of the library of matrix programs at the National Physical Laboratory and experience in using them.*

The only paper at present scheduled for Friday, September 6, is one entitled *Perturbation theory of matrices* by Tosio Kato of the University of Tokyo. It is expected that this session will be completed with further papers by Olga Taussky-Todd, John Todd, Alfred Brauer or others. In the afternoon there will be a panel discussion of computation of characteristic values and vectors, together with an overflow session for contributed papers, etc.

It should be emphasized to the readers of the *NOTICES* that the above program is quite tentative. It is presented here because of the interest which many of the readers of the *NOTICES* have in the topic of this special conference, and because it will not be possible to make a later announcement in the *NOTICES* in time for the conference. Persons who are

planning to attend the conference because of one or more of the special features listed above in the tentative program should obtain definite information as the date of the conference approaches, from Professor Wallace Givens of Wayne State University, Department of Mathematics, Detroit 2, Michigan.

THE THIRD UNITED STATES NATIONAL CONGRESS OF APPLIED MECHANICS will be held at Brown University, Providence, Rhode Island, on June 11–14, 1958.

All research workers in the field are cordially invited to submit papers constituting original experimental or theoretical contributions to Applied Mechanics, including mechanics of rigid bodies and deformable solids, mechanics of fluids and gases, thermodynamics and heat transfer. Instructions to authors of papers may be obtained from the Organizing Committee. It is expected that papers accepted by the Editorial Committee, with the advice of recognized authorities and presented at the Congress, will be published in full in the Proceedings of the Congress.

To be considered for presentation at the Congress, complete papers and manuscripts must be submitted to the Chairman of the Editorial Committee before January 1, 1958; to be scheduled for presentation the final manuscript of a paper must have been accepted before May 1, 1958. To avoid delays caused by overburdening reviewers and editorial staff, authors are urged to submit manuscripts well ahead of the deadline of January 1, 1958.

The papers will be grouped by subject and 30 minutes will be allotted for presentation and discussion of each paper. Arrangements will also be made for general lectures by outstanding authorities on subjects of general interest to members of the Congress. Facilities will be provided for informal discussions and social contact.

The Organizing Committee is as follows: William Prager, Chairman; D. C. Drucker, Secretary; E. H. Lee, Treasurer; R. M. Haythornthwaite, Chairman of the Editorial Committee; and E. T. Onat and R. T. Shield, Committee on Arrangements.

Inquiries regarding the Congress should be addressed to the Secretary of the Congress at Brown University, Box D, Providence 12, Rhode Island.

THE FOURTH ANNUAL SYMPOSIUM ON COMPUTERS AND DATA PROCESSING of the Denver Research Institute of the University of Denver, Colorado, will be held on August 29–30, 1957, at the Albany Hotel,

Denver, Colorado. The symposium will consist of two days of technical papers on components, devices, systems organization, analysis techniques, and design techniques. Further information can be obtained from J. Marshall Cavenah, Electronics Division, Denver Research Institute, University of Denver, Denver 10, Colorado.

AN INTERNATIONAL CONFERENCE ON SCIENTIFIC INFORMATION will be held in Washington, D. C. in November, 1958. The Conference will be sponsored by the National Academy of Sciences–National Research Council, the National Science Foundation, and the American Documentation Institute. Information on the conference can be obtained by writing to Dr. Alberto F. Thompson, Executive Secretary of the International Conference on Scientific Information, National Academy of Sciences, Washington 25, D. C.

THE SURVEY OF RESEARCH POTENTIAL AND TRAINING IN THE MATHEMATICAL SCIENCES. This Survey, which was financed by the National Science Foundation, was originally planned as an activity of a committee of the Division of Mathematics of the National Research Council. Later it was decided, for administrative convenience, to set the Survey up as a research contract with the University of Chicago under the direction of Professor A. A. Albert. The Committee on the Survey has acted as an independent organization and has now submitted a final report to the National Science Foundation. The following statement concerning the work of the Survey has been submitted to the *NOTICES* by Professor A. A. Albert, chairman of the Committee on this Survey.

The Committee on the Survey announces the completion of the *SURVEY OF RESEARCH POTENTIAL AND TRAINING IN THE MATHEMATICAL SCIENCES.* The Survey began in January 1955, and nearly thirty mathematicians have served on its Committee and four Subcommittees during the past two and one-half years.

The Survey has produced three documents. One of these is the Report on a Conference on Undergraduate Mathematics Curricula. The Conference was held at Hunter College on October 12–13, 1956 and was attended by 25 representatives of various colleges and universities. There were formal reports by various speakers covering many aspects of, and subjects related to, undergraduate education in mathematics, and these formal reports have been incorporated into the conference report. This document has been circulated widely. A small number of copies have been deposited with the National Science Foundation and are available on request.

The other two documents constitute the Final Report. Part I is a 163 page report on the organization of the Survey and the results of two large scale data gathering activities of the Committee. The first activity consisted of interviews of the principal Ph.D. granting institutions. Fifty-nine departments of mathematics were visited, and three others completed the interview schedule without a visit. The data presented as obtained by these interviews are concerned with such matters as facilities, libraries, promotion and leave policies, administration, and salaries. The remainder of the report presents a set of tables giving the composite life story of 1851 mathematicians who received the Ph.D. from 1915 to 1954, as derived from their replies to a very penetrating questionnaire.

Part II of the Final Report consists of the reports of the four Subcommittees, and the 28 resulting recommendations of the Committee. We note that the Subcommittee on Undergraduate Colleges recommended the extended support of prize competitions in mathematics, urged that an attempt be made to call to the attention of industry the need for support of mathematics in undergraduate colleges, and requested that the National Science Foundation publish annually an up-to-date record of the mathematics faculties of all colleges and universities with the degrees held, and the date and place these degrees were conferred.

The report of the Subcommittee on Research Environment discussed such matters as facilities, salaries, leaves and fellowships, and made a number of recommendations on these matters.

The Subcommittee on Non-Teaching Opportunities recommended the exploration of further methods for establishing understanding among academic mathematicians of the nature of non-academic mathematics and made recommendations on various other related matters. The report also called attention to the recent action of the American Mathematical Society in adding the SIAM Journal to the group of journals receiving a subsidy from the American Mathematical Society, and suggested the possibility that the Journal may provide another desirable publication outlet for some of the research results of non-academic mathematicians.

The final report, from the Subcommittee on Publications, recommended the establishment of a journal for expository articles, and the establishment of prizes for mathematical books, recommended the subsidization of mathematical publications by the National Science Foundation on a permanent basis, and recommended that the volume of translations published by the American Mathematical Society be at least doubled.

The Final Report has been distributed to the chairmen of about 110 departments of mathematics, to Committee and Subcommittee members, and to the officers of various mathematical organizations. A limited num-

ber of additional copies are available, and can be obtained by writing to the Program Director for Mathematics, National Science Foundation, 1520 H Street, Washington 25, D. C.

A REPORT OF A TECHNICAL ADVISORY COMMITTEE TO THE NATIONAL BUREAU OF STANDARDS. The membership of this Committee is determined through the Policy Committee for Mathematics. The Committee at present consists of David Blackwell, E. U. Condon, Mark Kac, P. M. Morse, Mina S. Rees, and A. H. Taub, who is Chairman. Professor Taub has requested that the *NOTICES* shall publish the following annual report of the Committee, which is dated May, 1957.

1. The Bureau of Standards Technical Advisory Committee for Mathematics has reviewed the work of the Applied Mathematics Division of the Bureau (Division 11) and finds that in spite of the difficulty this division is having in maintaining its present staff and acquiring new staff, it is providing very excellent mathematical, computational and statistical services to other agencies of the government as well as to other Bureau divisions. The four sections of Division 11: Numerical Analysis Section (11.01), the Computation Laboratory (11.02), the Statistical Engineering Laboratory (11.03) and the Mathematical Physics Section (11.04), have interesting, useful and imaginative research and training programs which make them effective organizations for the discharge of their responsibilities.

2. The Numerical Analysis section (11.01) has continued its outstanding work in modern Numerical Analysis and the use of computing machines in pursuing research problems in mathematics. In addition it has inaugurated a training program in Numerical Analysis for senior University staff.

The purpose of this program is to give regular university staff heretofore specializing in fields different from numerical analysis, a training in that field which will enable them to direct the operation of a university computing center, and to organize training and research in numerical analysis on their return to their own institutions. Thirteen people began work on this program on February 11, 1957 and will continue to be in residence at the Bureau of Standards until June 7, 1957. The funds for stipends to the participants and other expenses in connection with this training program were supplied by the National Science Foundation.

Trainees will be taught programing for SEAC and will be given a very intensive course of lectures on classical numerical analysis; linear equations and matrix inversion; quadrature and ordinary differential equations characteristic values of matrices; partial differential equations; integral

equations; linear programing and non-linear equations. In addition lectures will be given covering a variety of other topics including recursive functions and Turing machines, statistical calculations, discrete variable problems and some experimental mathematical calculations.

The lecturers include in addition to members of the staff of the Applied Mathematics Division of the Bureau, mathematicians of note presently engaged in research on one or more of the topics listed above.

This training program should greatly stimulate teaching and research in numerical analysis in universities. It complements the work being done at some universities and does not conflict with it since the universities are in the main concerned with the training of students and this program has as its trainees established mathematicians.

3. The Computation Laboratory (Section 11.02) like other sections of the Division, is having difficulty in maintaining its staff. If this situation is viewed as an educational service to the community in that it furnishes to industry and to other agencies of the government young people with good training in computing procedures, the Bureau may well take pride in the role it is playing.

However, the problem is a difficult one, particularly as the Section experiences a need for the expansion of its staff to provide for the increased work it must undertake with the delivery of the IBM 704 and the obligation to provide some programing help to DOFL.

The Handbook of Mathematical Tables is progressing well. The Section is to be particularly commended for drawing into the work experts in the special phases of mathematics that are represented either by securing the temporary services of these experts at the Bureau, or by contracting out the preparation of specific parts of the book.

4. Statistical Engineering Laboratory (Section 11.03) has as a major activity consulting with scientists in other divisions of the Bureau on statistical aspects of their problems, including design of experiment and analysis of results. It is performing this function well, and its services are in great demand. The SEL continues to be a center of basic research in experimental design; ten research papers in experimental design are in process of publication in various technical journals. The reliability study recently undertaken by SEL has made a good beginning and promises to produce valuable results.

5. Mathematical Physics Section (11.04) carries on fundamental research on problems of its own, and has the function of providing high level specialist consulting services to other parts of the Bureau in the field of mathematical physics. The committee finds that a good program of work is going forward within the limitations of the small staff available.

The idea of having a central consulting group on difficult problems of mathematical physics to serve the rest of the Bureau is sound and commendable. But it can only function effectively if its staff includes creative scientists of the highest caliber. By its nature the work can not be carried on effectively by persons in the lower ranks. It follows necessarily that this section must develop in a way that its staff will have considerably higher than average grade ratings as compared with the rest of the Bureau of other comparable scientific laboratories.

The development thus far has been mostly in the direction of fundamental work on theoretical mechanics. In the years to come corresponding staff strengthening should occur to permit the rendering of effective consulting service in thermodynamics, statistical mechanics, chemical physics, electrodynamics and so on.

During the past year important contributions were made by the section in exact non-linear water wave theory, theoretical elasticity, the theory of elastic surface waves, the theory of diffraction and reflection of electromagnetic waves and the study of the Fourier transformations for distribution functions occurring in applied statistics.

The strength of the section in carrying on this program of highly original work has been greatly enhanced because the Bureau has been following a wise and highly praiseworthy policy of having on its staff a succession of some of the most renowned mathematical physicists in the world for varying periods as visitors. These have included Stoneley of Cambridge, England, Synge of Dublin, Eire, Schultz-Grunow of Aachen, West Germany, Burgers of Delft, Holland, and Walz of Göttingen, West Germany.

The field of mathematical physics is one that gains in creative productivity in unusual degree from stimulating contacts with great men in the field from other lands. The Bureau is indeed to be congratulated, in the opinion of the committee, on having developed such a first-rate stimulating atmosphere that men of such high distinction find it worth while to spend some time there as visiting research workers, and to give the Bureau the benefit of sharing their latest research ideas. This phase of the program represents a very genuine step forward which deserves every encouragement.

Since further recruiting will be required to maintain the research of this section at its present level of excellence, and to extend their consulting service to other divisions of the Bureau, it may be useful to review the philosophy behind the establishment of Section 11.04, to see how important its maintenance might be. Many divisions of the Bureau deal with various aspects of classical (non-atomic) physics and, in or-

der to improve their measurement techniques and broaden their service coverage, they require detailed theoretical computations in the fields of classical physics. Many of these computations are difficult enough to be classed as important research projects in theoretical physics, requiring theoretical physicists of exceptional ability to solve them successfully.

One way to get such problems solved is for each Division of the Bureau to hire theoretical specialists in their own field, but this has several disadvantages. The number of challenging problems arising in any one Division may not be sufficient to attract the services of a first-class man and the general attitude of the Division may be such as to discourage theoretical research in new directions. Moreover the specialist, being isolated in one Division, may find it difficult to obtain the advice and encouragement from other theoretical workers, in other specialties, which often can make the difference between failure and success in some difficult problem.

Section 11.04 represents an alternate way of providing such specialized consulting services. The theoretical physicists are kept as a group, supporting each other in their work and able to divert manpower, as needed, to various important problems as they arise in the various Divisions. This arrangement utilizes scarce manpower more effeciently and makes it easier to attract good men, but it places a considerable responsibility on the head of the Section to keep in touch with the various Divisions of the Bureau so that the Section can be of real help to them (even, at times, to the extent of persuading the Divisions to get interested in an area which they had neglected before).

If the Bureau is convinced that the maintenance of Section 11.04 is the correct way to provide consulting services for the Divisions on difficult theoretical problems, it must be prepared to make special efforts to recruit the experienced personnel needed by the Section. A Section with these responsibilities, staffed by mediocre people, would defeat its purpose. If such recruiting involves the hiring of specialists from Europe, special arrangements should be made to make this possible.

THE PROCEEDINGS OF THE THIRD BERKELEY SYMPOSIUM ON MATHEMATICAL STATISTICS AND PROBABILITY. Professor Jerzy Neyman has suggested that we once again bring to the attention of the members of the Society that a special arrangement exists which gives members of the Society a 25% discount in purchasing these Proceedings. The contents of the Proceedings were described in the June, 1956, issue of the *NOTICES*. The titles of the five volumes together with prices are,

of course, listed in the Catalog of the Society. To obtain a discount, orders must be sent directly to the Statistical Laboratory, University of California, Berkeley 4, California. They must refer to membership in this Society and be accompanied by checks for the correct amount. The checks should be made out to the University of California Press.

THE JOURNAL OF MATHEMATICS AND MECHANICS. The Editors of the Journal of Mathematics and Mechanics (formerly the Journal of Rational Mechanics and Analysis) wish to invite the attention of the members of the American Mathematical Society to the fact that space is available for publication of mathematical research papers meeting the editorial standards of the Journal. The Journal is published bimonthly by the Graduate Insititue for Mathematics and Mechanics of Indiana University, Bloomington, Indiana.

The Journal aims to close the gap between "pure" and "applied" mathematics, and to foster the discipline of mechanics as a deductive mathematical science. It gives rapid publication to research of unusual importance, depth, and permanence. English, French, German, and Italian are the languages of the Journal. Authors should strive for a high level of expository clarity and employ a good literary style. It is desirable that every paper should contain a simple but explicit summary of results, preferably in the opening paragraphs.

The scientific content of the Journal is in the hands of an editorial board whose members communicate manuscripts they consider worthy of publication. An author desiring to publish in the Journal should therefore send his manuscript to an appropriate member of the Board, and a copy of the covering letter to the editors at Indiana University. However, the manuscripts may also be sent directly to the editors.

The Journal is edited by M. Rosenblatt, T. Y. Thomas, and J. W. T. Youngs with the assistance of J. R. Blum and R. E. MacKenzie. The Editorial Board consists of the following persons: S. Bergman, Stanford University, California; R. Berker, Technical University, Istanbul; L. Bers, Institute of Mathematical Sciences, New York University; R. Brauer, Harvard University, Cambridge, Massachusetts; L. Cesari, Purdue University, Lafayette, Indiana; S. S. Chern, University of Chicago, Illinois; A. Erdélyi, California Institute of Technology, Pasadena, California; Irmgard Flügge-Lotz, Stanford University, California; D. Gilbarg, Indiana University, Bloomington, Indiana; A. M. Gleason, Harvard University, Cambridge, Massachusetts; H. Görtler, Mathematisches Institut Universität, Freiburg i. Br.; D. Graffi, Istituto Matematico "Salvatore Pincherle", Università di Bologna; U. Grenander, Institute of Mathemat-

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THE JOURNAL OF THE SOCIETY FOR INDUSTRIAL AND APPLIED MATHEMATICS. The Council has recommended and the Trustees have authorized the payment of a subsidy of $1,000 per year to the Journal of the Society for Industrial and Applied Mathematics for three years, with the first payment to be made in June, 1957.

Dr. I. E. Block, Chairman of the Publications Committee of SIAM, has submitted the following statement on behalf of the editors of the SIAM Journal.

"The editors of the Journal of the Society for Industrial and Applied Mathematics invite members of the American Mathematical Society to submit papers in mathematics which lie within the scope of the editorial policy of the Journal.

The Journal includes both research papers and expository papers. Manuscripts which have application to, or may refer to, industrial or scientific problems are considered especially suitable for publication.

Papers submitted for publication should be sent in duplicate to: Publications Committee, SIAM, P. O. Box 7541, Philadelphia 1, Pennsylvania.

Manuscripts should be typewritten (double spaced), and mathematical symbols inserted by hand should be carefully written.

Questions and editorial correspondence should be addressed to the Publications Committee at the address given above.

The editors of the Journal look forward to the possibility that many members of the American Mathematical Society will participate in the Journal publications as authors."

OTHER SUBSIDIES. It was noted in the previous item that the Journal of the Society for Industrial and Applied Mathematics is to receive a $1,000 a year subsidy from the Society for the next three years. At the same time that this action was taken, a similar action was taken in connection with the Michigan Mathematical Journal, involving the same amount of money and the same timing of the payments. In December, 1955, the Board of Trustees voted to approve a subvention of $1,000 for three years to the Illinois Journal of Mathematics for the calendar years 1956, 1957, and 1958, with payments to be made in June of each of these years.

The inclusion of these journals in the subsidized journals of the Society means that they are also included in the page count which forms the basis for the Society's institutional dues and which also forms a basis for determining the amount of any permanent subsidy which might later be granted to these journals.

NEW MEMOIRS. *MEMOIRS* No. 23 by D. G. Dickson, is now available. It is entitled *Expansions in Series of Solutions of Linear Difference-Differential and Infinite Order Differential Equations with Constant Coefficients.* The list price of this *MEMOIR* is $1.70 with the usual 25% discount to members of the Society. This *MEMOIR* is in part a study of expansions of functions in series of fundamental solutions of the linear, homogeneous difference-differential equation with constant coefficients. The expansions hold in translations of the conjugate indicator diagram of the characteristic function. Solutions are expanded in regions generated by translations of the diagram. A study of exponential sums with asymptotically polynomial coefficients is included. Also investigated here are expansions of solutions of the linear, homogeneous, infinite order differential equation of exponential type in series of fundamental solutions.

MEMOIRS No. 24, entitled *Partially Ordered Linear Topological Spaces* by Isaac Namioka is also now available. The list price is $1.60, with the usual 25% discount to members of the Society. This paper is mainly an investigation of the following topics in the general setting of linear topological spaces: extension of positive functionals, continuity of positive transformations, decomposition of functionals into positive and negative parts. Vector lattices are considered in the last Chapter.

A NEW ASSISTANT DIRECTOR FOR THE NATIONAL SCIENCE FOUNDATION'S DIVISION OF MATHEMATICAL, PHYSICAL, AND ENGINEERING SCIENCES. The NSF has announced that Englehardt Au-

gust Eckhardt, formerly vice president in charge of research for the Gulf Research and Development Company, Pittsburgh, Pennsylvania, has been appointed Assistant Director of the National Science Foundation for the Division of Mathematical, Physical, and Engineering Sciences. Raymond J. Seeger, who has filled the position in an acting capacity, will continue as Deputy Assistant Director for the Division.

Dr. Eckhardt worked for the Bureau of Standards from 1917–1925. From 1925 up until the present he has been associated with, first, the Marland Oil Company and then the Gulf Research and Development Company in various administrative and consultant capacities. He is a physicist who has done work in geophysics, ballistic measurements, and building acoustics. From 1908 to 1917, he was an instructor and assistant professor of physics at the University of Pennsylvania, except for a period in 1912–1913 when he was studying at the University of Göttingen, in Germany.

A NEW EXECUTIVE SECRETARY FOR THE DIVISION OF MATHEMATICS OF THE NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL. Monroe H. Martin has resigned, effective July 11, 1957, from the position of Executive Secretary of the Division of Mathematics of the NAS-NRC. He is succeeded by Harold W. Kuhn who is an Assistant Professor at Bryn Mawr College.

A PROFESSORSHIP OF MATHEMATICAL STATISTICS AND PROBABILITY AT BROWN UNIVERSITY. The establishment of a professorship of Mathematical Statistics and Probability and the naming of Dr. Ulf Grenander to the post has recently been announced by the president of Brown University, Dr. Barnaby C. Keeney.

Dr. Grenander has been serving as Acting Chairman of the Department of Mathematical Statistics at the University of Stockholm. The professorship will be located in the University's Division of Applied Mathematics. Dr. Grenander will take up his duties on September 1, 1957.

BACKLOGS OF CERTAIN MATHEMATICAL RESEARCH JOURNALS. Information on this important matter is being published twice a year in the *NOTICES*, with the kind cooperation of the respective editorial boards.

It is important that the reader should interpret the data with full allowance for the wide and sometimes meaningless fluctuations which are characteristic of them. The waiting times in particular are affected by many transient effects, which arise in part from the refereeing system.

Extreme waiting times as observed from the published dates of receipt of manuscripts may be very misleading, and for that reason, no data on extremes are presented in the table below.

	1	2	3		4	5		
Journal	No. issues per year	Approx. no. pages published currently per year	Backlog 5/31/57 (Pages)	Backlog 11/30/56 (Pages)	Estimated Current Waiting time (Months)	Observed Waiting time in latest issue Q_1 (Mos.)	Med. (Mos.)	Q_3 (Mos.)
Transactions	6	1,650	1,160	500	16	11	11	12
Proceedings	6	1,300	170	300	9	11	12	12
American Journal	4	900	NR[a]	NR[a]	NR[a]	3	5	6
Annals	6	1,200	350	185	11	12	15	19
Duke Journal	4	700	200	75	10	6	9	10
Canadian Jnl.	4	600	106	90	8	9[b]	13[b]	14[b]
Pacific Jnl.	4	850–900	100	NR[a]	8–10	12[c]	14[c]	14[c]
Annals of Math. Stat.	4	1,150	180	254	10	7	9	14
Quarterly of App. Math.	4	450	NR[a]	NR[a]	NR[a]	13	14	15

Footnotes: [a] NR means that either no response was received to a request for information, or else that the response contained data in another form.

[b] Issues are undated; these data based on second number of the 195[illegible] volume, which was arbitrarily counted as the June, 1957 issue.

[c] Issues are now undated; these data based on "Winter" 1956 issue which was arbitrarily counted as the December, 1956 issue.

Some of the colums in the table above are not quite self-explanatory, and here are some further details concerning how the figures were computed.

Column 2. These figures are rounded off to the nearest 50.

Column 3. For each journal, this is the estimate as of the indicated dates, of the total number of printed pages which will have been *accepted* by the next time that manuscripts are to be sent to the printer, but which nevertheless will *not* be sent to the printer at that time. (It should be noted that the number of pages *received* but not yet *accepted* are being ignored.)

Column 4. Estimated by the editors (or the Editorial Department of the American Mathematical Society in the case of the Society's journals),

and based on these factors: manuscripts accepted, manuscripts received and under consideration, manuscripts in galley, and rate of publication.

Column 5. The first quartile (Q_1) and the third quartile (Q_3) are presented, to give a measure of the dispersion which will not be too much distorted by meaningless extreme values. The median (Med.) is used as the measure of location. The observations were made from the latest issue received in the Headquarters Offices before the deadline date for this issue of the *NOTICES*. The waiting times were measured by counting the months from receipt of manuscript *in final revised form*, to nominal month of issue (not counting in month of receipt but counting in month of issue). It should be noted that when a paper is revised, the waiting time between receipt by editors of the final revision and its publication may be much shorter than is the case for a paper which is not revised, so these figures are to that extent distorted on the low side.

CHANGED ADDRESSES. Members of the Society are advised that the Headquarters Offices deadline for changes of addresses which should appear in the forthcoming COMBINED MEMBERSHIP LIST, is October 15. The Headquarters Offices will appreciate having any changes which must be incorporated in the COMBINED MEMBERSHIP LIST sent into the office as soon as possible.

Please remember that if a new position goes with the new address, full information should be given for the COMBINED MEMBERSHIP LIST. Please also advise as to when the new address is to be effective.

A change of address should always be submitted to the Society at least six weeks before it is to become effective. Otherwise one or more copies of the journals will be sent to the wrong address, and return or forwarding postage must be paid by the Society. Each of the journals of the Society is mailed by the printer from a strip list furnished by the Headquarters Offices, and as all readers of the *NOTICES* undoubtedly know from experience with other magazine subscriptions, it is not feasible to avoid a considerable time lag between receipt of, and implementation of, instructions from a subscriber.

"LET NO ONE IGNORANT OF COHOMOLOGY THEORY ENTER HERE". This is the translation of the month of the Greek inscription on the members' emblem of the American Mathematical Society. The new translation is especially in honor of the Colloquium lectures to be given by Professor Norman E. Steenrod at the Summer Meeting to be held at Pennsylvania State University.

The emblem is made from 1/10 10K goldfilled material, with a rim

filled with hard blue-fired vitreous enamel. It displays the seal of the Society. The emblem is available with stud and post or as a pin with safety catch. The price of the emblem is $2.00 postpaid, including tax. Orders should be sent to the Headquarters Offices of the Society, 190 Hope Street, Providence 6, Rhode Island. Please state which type is wanted when ordering.

THE WE'RE SORRY DEPARTMENT. The following errors appeared in the 1956 *Combined Membership List:*

Dr. F. E. Browder of Yale University should have been listed as an assistant professor.

Dr. J. J. Sopka was listed as being an applied science representative for International Business Machines Corporation. He is with the Mathematical Analysis Group.

PERSONAL ITEMS

(This section is restricted to members of the Society)

Associate Professor B. H. Arnold, Oregon State College, has been granted a Fulbright award and will be teaching at Higher Teachers Training College, Bagdad, Iraq during 1957–58.

Lieutenant P. P. Billingsley of the U. S. Navy has been awarded a National Science Foundation Postdoctoral Fellowship at Princeton University for 1957–1958.

Professor Emeritus Louis Brand has received an appointment as M. D. Anderson Professor of Mathematics at the University of Houston for 1957–1958.

Assistant Professor N. J. Divinsky of the University of Manitoba has been awarded a Royal Society of Canada Postdoctoral Scholarship at Queen Mary College, University of London for one year.

Professor Leopoldo Nachbin of the University of Brazil has been awarded a Rockefeller Foundation Fellowship at the University of Chicago.

National Research Council-National Bureau of Standards has awarded a postdoctoral research associateship to Dr. M. H. Pearl of the University of Rochester.

Professor S. M. Shah of Muslim University, Aligarh has been elected a Fellow of the Royal Society of Edinburgh.

Visiting Assistant Professor S. S. Abhyankar of Columbia University has been appointed to an assistant professorship at Cornell University.

Dr. J. W. Addison, Jr. of the Institute for Advanced Study has been appointed to an assistant professorship at the University of Michigan.

Dr. A. G. Anderson of Jones and Laughlin Steel Corporation has accepted a position as chief statistician with the General Tire and Rubber Company, Akron, Ohio.

Dr. Maurice Auslander of the Institute for Advanced Study has been appointed to an assistant professorship at Brandeis University.

Dr. W. L. Baily, Jr. of Massachusetts Institute of Technology has been appointed to an assistant professorship at University of Chicago.

Dr. L. C. Barrett of the University of Utah has been appointed to an associate professorship at South Dakota School of Mines and Technology.

Dr. J. H. Bell of Bendix Aviation Corporation has accepted a position as technical director with AC Spark Plug Division of General Motors Corporation, Milwaukee, Wisconsin.

Assistant Professor D. C. Benson of Carnegie Institute of Technology has been appointed to an assistant professorship at University of California, Davis.

Dr. Armand Borel of Federal Institute of Technology, Zurich, Switzerland has been appointed to a professorship at the Institute for Advanced Study.

Mr. R. D. Boswell, Jr. of University of Georgia has been appointed to an associate professorship at Mississippi State College.

Dr. W. E. Boyce of Brown University has been appointed to an assistant professorship at Rensselaer Polytechnic Institute.

Assistant Professor Fred Brafman of Southern Illinois University has been appointed to an associate professorship at the University of Oklahoma.

Dr. C. C. Braunschweiger of Purdue University has been appointed to an assistant professorship at University of Delaware.

Dr. H. J. Bremermann of Institute for Advanced Study has been appointed to an assistant professorship at University of Washington.

Mr. K. L. Brinkman of U. S. Army has accepted a position as engineer with Hughes Aircraft, Culver City, California.

Dr. Leon Brown of Tulane University has been appointed to an assistant professorship at Wayne State University.

Dr. R. J. Buehler of University of Wisconsin has been appointed to an assistant professorship at Iowa State College of Agriculture and Mechanic Arts.

Dr. E. L. Buell of Northwestern University has been appointed to a professorship at Worcester Polytechnic Institute.

Mr. F. C. Calabrese of Goodyear Aircraft Corporation has accepted a position as associate engineer for Special Engineering Products Division, International Business Machines Corporation, Poughkeepsie, N.Y.

Dr. A. M. Chak of Duke University has been appointed to an assistant professorship at Lucknow University.

Assistant Professor H. E. Chrestenson of Whitman College has been appointed to an assistant professorship at Reed College.

Dr. John Cocke of Duke University has accepted a position with International Business Machines Corporation, Poughkeepsie, New York.

Dr. E. J. Cogan of Dartmouth College has been appointed a member of the faculty of Sarah Lawrence College.

Assistant Professor K. L. Cooke of State College of Washington has been appointed to an assistant professorship at Pomona College.

Professor W. H. H. Cowles of Pratt Institute has retired.

Dr. Frederic Cunningham, Jr. of Bryn Mawr College has been appointed to an assistant professorship at Wesleyan University.

Mr. Ralph Deutsch of Hughes Aircraft Company has accepted a position as executive engineer for Philco Corporation, Philadelphia, Pennsylvania.

Mr. R. A. Dibrell, Jr. of the Artillery School, Fort Bliss, Texas has been appointed as chief of the Analysis Division, Ent Air Force Base, Colorado Springs, Colorado.

Assistant Professor Eldon Dyer of Johns Hopkins University has been appointed to an assistant professorship at University of Chicago.

Dr. D. O. Ellis of National Cash Register Company has accepted a position as head research scientist with Litton Industries, Beverly Hills, California.

Mr. Ky Fan of the University of Notre Dame has accepted a position on the Mathematics Panel at Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Mr. L. R. Ford, Jr. of Rand Corporation has accepted a position with the Combat Development Division, Fort Huachuca, Arizona.

Professor G. E. Forsythe of the University of California, Los Angeles has been appointed to a professorship at Stanford University.

Associate Professor David Gale of Brown University is on leave of absence and has accepted a position as consultant at RAND Corporation, Santa Monica, California.

Dr. Betty J. Gassner of Control Instrument Company, Brooklyn, New York has accepted a position as research analyst for Remington Rand Corporation, New York, New York.

Associate Professor David Gilbarg of Indiana University has been appointed to a professorship at Stanford University.

Dr. Seymour Ginsburg of Northrop Aircraft Corporation has accepted a position as senior research engineer at National Cash Register Company, Hawthorne, California.

Assistant Professor Felix Haas of the University of Connecticut has been appointed to an associate professorship at Wayne State University.

Dr. J. K. Hale of Sandia Corporation has accepted a position as a member of the Mathematical Research Department of Remington Rand Univac, Saint Paul, Minnesota.

Dr. P. R. Halmos of University of Chicago has been appointed a member of the Institute for Advanced Study.

Dr. J. W. Hollingsworth of General Electric Company has been appointed to a visiting associate professorship at Rensselaer Polytechnic Institute.

Mr. M. S. Johnson of Melpar, Incorporated has accepted a position as research engineer with the Jet Propulsion Laboratory, Pasadena, California.

Mr. W. H. Jones of the Defense Department, Washington, D. C. has accepted a position as statistician with the System Development Corporation, Santa Monica, California.

Dr. W. B. Jurkat of the University of Tubingen has been appointed to a visiting associate professorship at Syracuse University.

Dr. E. L. Kaplan of Bell Telephone Laboratories has been appointed a mathematician at the University of California Radiation Laboratory, Livermore, California.

Mr. J. E. Kist of Purdue University has been appointed to an assistant professorship at Wayne State University.

Professor S. C. Lowell of New York University has been appointed professor and director of the Graduate Program in Mathematics and Applied Physics at Adelphi College.

Professor W. G. Madow of the University of Illinois has been appointed a consulting professor at Stanford University and a senior research statistician at Stanford Research Institute.

Mr. M. J. Mansfield of Purdue University has been appointed to an assistant professorship at Washington and Jefferson College.

Assistant Professor M. D. Marcus of the University of British Columbia has been appointed to a research associateship at the National Research Council – National Bureau of Standards, Washington, D. C.

Mr. D. C. McGarvey of Yale University has accepted a position as mathematician at RAND Corporation, Santa Monica, California.

Assistant Professor H. P. McKean, Jr. of Massachusetts Institute of Technology is on leave and has been appointed to an instructorship at Kyoto University, Kyoto, Japan.

Dr. J. D. McKnight, Jr. of University of South Carolina has accepted a position as research scientist, Missile Systems Division of Lockheed Corporation, Palo Alto, California.

Associate Professor B. C. Meyer of the University of Arizona has been appointed to an assistant professorship at the University of Colorado.

Associate Professor E. P. Miles, Jr. of Alabama Polytechnic Institute has been appointed to a visiting associate research professorship at the University of Maryland.

Dr. H. W. Milnes of Wayne State University has accepted a position with the research staff of General Motors Corporation, Detroit, Michigan.

Mr. W. D. Montgomery of Iowa State College of Agriculture and Mechanic Arts has accepted a position as senior research engineer with Convair, San Diego, California.

Mr. J. M. Osborn, Jr. of Yale University has been appointed to an assistant professorship at Georgia Institute of Technology.

Dr. O. G. Owens of Sandia Corporation has been appointed to an associate professorship at Wayne State University.

Dr. G. O. Peters of Aircraft Armaments, Incorporated has accepted a position as research analyst for Kirk Engineering Company, Philadel-

phia, Pennsylvania.

Mr. R. J. Pipino of Western Reserve University has accepted a position as research staff assistant with The Institute for Cooperative Research, Ballistic Analysis Laboratory, The Johns Hopkins University.

Dr. L. B. Rall of Shell Development Company has been appointed to an associate professorship at Lamar State College of Technology.

Mr. J. A. Riley of Boston College has accepted a position as research associate at Parke Mathematical Laboratories, Carlisle, Massachusetts.

Professor E. K. Ritter of Georgia Institute of Technology has accepted a position as manager, Mathematical Analysis Department, Lockheed Aircraft Corporation, Marietta, Georgia.

Assistant Professor E. S. Robbins of Arizona State College has been appointed to an assistant professorship at Fresno State College.

Dr. T. L. Saaty of Massachusetts Institute of Technology has accepted a position as operations analyst with the U. S. Navy Department, Washington, D. C.

Dr. E. J. Schweppe of the University of Nebraska has been appointed to an assistant professorship at Iowa State College of Agriculture and Mechanic Arts.

Mr. R. F. Shaw of the Underwood Corporation has accepted a position as vice president of Digitronics Corporation, Albertson, New York.

Associate Professor Annette Sinclair of Southern Illinois University has been appointed to an associate professorship at Purdue University.

Dr. Maurice Sion of the University of California, Los Angeles, has been appointed to an assistant professorship at the University of California, Berkeley.

Professor H. W. Smith of Oklahoma Agricultural and Mechanical College has been appointed to a professorship at the University of South Carolina.

Associate Professor W. K. Smith of Bucknell University has been appointed to an associate professorship at Antioch College.

Dr. Andre Weil of the University of Chicago has been appointed to a professorship at the Institute for Advanced Study.

Mr. L. R. White of the Naval Research Laboratory has accepted a position with Boeing Airplane Company, Seattle, Washington.

Mr. Peter Yff of the University of Illinois has been appointed to an assistant professorship at Fresno State College.

The following promotions are announced:

W. D. Barcus, Brown University, to an assistant professorship.

W. E. Barnes, State College of Washington, to an assistant professorship.

C. F. Briggs, Wayne State University, to an assistant professorship.

R. A. Clark, Case Institute of Technology, to an associate professorship.

C. S. Coleman, Wesleyan University, to an assistant professorship.

P. F. Conrad, Tulane University, to an associate professorship.

D. J. Ewy, Fresno State College, to an assistant professorship.

Melvin Henriksen, Purdue University, to an associate professorship.

Walter Hoffman, Wayne State University, to an assistant professorship.

T. C. Kipps, Fresno State College, to an assistant professorship.

R. G. Kuller, Wayne State University, to an assistant professorship.

C. W. Larson, Ripon College, to an assistant professorship.

Shu-Teh C. Moy, Wayne State University, to an assistant professorship.

E. S. Northam, Wayne State University, to an assistant professorship.

A. E. Nussbaum, Rensselaer Polytechnic Institute, to an assistant professorship.

C. A. Page, University of Illinois, to an assistant professorship.

T. K. Pan, University of Oklahoma, to a professorship.

F. D. Parker, Clarkson College of Technology, to a professorship.

Alice T. Schafer, Connecticut College, to an associate professorship.

Clifford Spector, Ohio State University, to an assistant professorship.

C. K. Tsao, Wayne State University, to an associate professorship.

S. L. Warner, Duke University, to an assistant professorship.

John Wermer, Brown University, to an associate professorship.

Albert Wilansky, Lehigh University, to a professorship.

Frances M. Wright, Harpur College, to an associate professorship.

The following appointments to instructorships are announced:

Amherst College: Dr. H. G. Loomis; Brown University: Dr. D. K. Harrison; Harvard University: Dr. Robert Hermann; Lehigh University: Mr. Paul Axt, Mr. E. K. Dorff, Mr. J. I. Nassar, Mr. F. C. Oglesby; Massachusetts Institute of Technology: Dr. R. I. Dames; Ohio State University: Dr. Angelo Margaris; Purdue University: Mr. H. G. Moore; Wesleyan University: Dr. R. G. Long, Dr. John McKibben.

Deaths:

Professor Emeritus C. F. F. Garis of Union College died January 1, 1957 at the age of seventy-six years. He had been a member of the Society for forty years.

Associate Professor Emeritus Vincent C. Poor of the University of Michigan died March 14, 1957 at the age of eighty-one years. He had been a member of the Society for forty-one years.

NEW PUBLICATIONS

Adavi, S. V. See Dowker, C. H.

Aĭzerman, M. A. *Lekcii po teorii avtomatičeskogo regulirovaniya.* Moscow, Gosudarstv. Izdat. Tehn.-Teor. Lit., 1956. 428 pp. 12.10 rubles.

Bartsch, W. See Brzoska, F.

Belevitch, V. *Théorie des circuits de télécommunication.* Louvain, Librairie Universitaire, 1957. 8+384 pp.

Birkhoff, G., and Zarantonello, E. H. *Jets, wakes, and cavities.* New York, Academic Press, 1957. 12+353 pp. $10.00.

Bohm, D. *Causality and chance in modern physics.* Foreword by L. de Broglie. Princeton, Van Nostrand, 1957. 11+170 pp. $5.00.

Boltjanski, W. G. *Differentialrechnung einmal anders.* Berlin, VEB Deutscher Verlag der Wissenschaften, 1956. 5+60 pp.

Bourbaki, N. *Eléments de mathématique.* XXI. Part 1. *Les structures fondamentales de l'analyse.* Book VI. *Intégration.* Chapter V. *Intégration des mesures.* (Actualités Sci. Ind., no. 1244.) Paris, Hermann, 1956. 2+131 pp.

de Broglie, L. See Bohm, D., Dugas, R.

Brzoska, F., and Bartsch, W. *Mathematische Formelsammlung.* Leipzig, Fachbuchverlag, 1956. 10+345 pp. 7.80 DM.

Carafoli, E. *High-speed aerodynamics (compressible flow).* Bucharest, Editura Tehnică, 1956. 710 pp. (2 plates).

Carathéodory, C. *Gesammelte mathematische Schriften.* Vol. 5. Published with the assistance of the Bayerischen Akademie der Wissenschaften. Munich, Beck, 1957. 15+447 pp., 1 plate. 43.00 DM.

Carleman, T. *Problèmes mathématiques dans la théorie cinétique des gaz.* Uppsala, Almqvist and Wiksells, 1957. 112 pp.

Churchill, S. W. See Clark, G. C.

Clark, G. C., and Churchill, S. W. *Tables of Legendre polynomials,* Engineering Research Institute, University of Michigan, 1957. 9+92 pp. $4.50.

Cohn-Vossen, S. See Hilbert, D.

Couchet, G. *Mouvements plans d'un fluide en présence d'un profil mobile.* (Mémor. Sci. Math., no. 135.) Paris, Gauthier-Villars, 1956. 80 pp.

Danilow, W. W. *Präzisionspolygonometrie.* Berlin, VEB Verlag Technik, 1957. 228 pp.

Davidson, D., Suppes, P., and Siegel, S. *Decision making: An experimental approach.* Stanford University Press, 1957. 9+121 pp. $3.25.

Davison, B., and Sykes, J. B. *Neutron transport theory.* Oxford, Clarendon, 1957. 20+450 pp. 75 s.

Dekanosidze, E. N. *Tablicy cilindričeskih funkciĭ ot dvuh peremennyh.* Moscow, Izdat. Akad. Nauk SSSR, 1956. 495 pp., 3 plates. 50.6 rubles.

Delone, B. N. *Èlementarnoe dokazatel'stvo neprotivorečivosti planimetrii Lobačeveskogo.* Moscow, Gosudarstv. Izdat. Tehn.-Teor. Lit., 1956. 140 pp. 3.05 rubles.

Dieste, R. *Nuevo tratado del paralelismo.* Buenos Aires, Atlantida, 1956. 186+12 pp.

Dijksterhuis, E. J. *Archimedes.* Copenhagen, Munksgaard, 1956. 422 pp. $12.50.

Dixmier, J. *Les algèbres d'opérateurs dans l'espace hilbertien (Algèbres de von Neumann).* (Cahiers scientifiques, no. 25.) Paris, Gauthier-Villars, 1957. 6+367 pp. 5.500 fr.

Dowker, C. H. *Lectures on sheaf theory.* Notes by S. V. Adavi and N. Ramabhadran. Bombay, Tata Instute of Fundamental Research, 1956. 5+212+4+3 pp. (mimeographed)

Dugas, R. *A history of mechanics.* Foreword by L. de Broglie. Trans. by J. R. Maddox. New York, Central Book Co., 1957. 671 pp.

Escande L. See Gerber, S.

Fassbender, J., and Hoppe, W. *Eine photoelektrische Nachlaufeinrichtung für Analogie-Rechenmaschinen.* Cologne, Westdeutscher Verlag, 1956. 20 pp.

Fröberg, C.-E. *Hexadecimal conversion tables.* Lund, CWK Gleerup, 1957. 26 pp. 3 kr.

Gelfand, I. M., and Neumark, M. A. *Unitäre Darstellungen der klassischen Gruppen.* Berlin, Akademie-Verlag, 1957. 40+333 pp. 36.00 DM.

Gerber, S. *Étude théorique et expérimentale de la stabilité des chambres d'équilibre situées en aval d'une galerie en charge alimentée par un canal à écoulement libre.* Preface by L. Escande. (Publ. Sci. Tech. Ministère de l'Air, no. 320.) Paris, 1956. 5+122 pp. 1400 fr.

Goode, H. H., and Machol, R. E. *System engineering: An introduction to the design of large-scale systems.* New York, McGraw-Hill, 1957. 12+551 pp. $10.00.

Goodstein, R. L. *Mathematical logic.* Leicester University Press, 1957. 8+104 pp. 21 s.

Grosche, G. *Projektive Geometrie.* Leipzig, Teubner, 1957. 6+204 pp. 10.20 DM.

Haack, W. *Darstellende Geometrie.* III. *Axonometrie und Perspektive.* (Sammlung Göschen, vol. 144.) Berlin, de Gruyter, 1957. 127 pp. 2.40 DM.

Hendricks, W. A. *The mathematical theory of sampling.* New Brunswick, The Scarecrow Press, 1956. 7+364 pp. $7.50.

Hieke, M. *Vektoralgebra.* Leipzig, Teubner, 1956. 6+154 pp. 9.20 DM.

Hilbert, D., and Cohn-Vossen, S. *Geometria pogladowa.* [Intuitive geometry.] Warsaw, Państwowe Wydawnictwo Naukowe, 1956. 319 pp. 24.50 zł.

Hof, H. *Powers, roots, reciprocals, from .0001–15000.* Jenkintown, Professional Supply Company, 1957. 3+200+3+300+1+24 pp.

Hofmann, J. E. *The history of mathematics.* New York, Philosophical Library, 1957. 11+132 pp. $4.75.

Hoppe, W. See Fassbender, J.

Interpolation and allied tables. Prepared by H. M. Nautical Almanac Office. London, Her Majesty's Stationery Office, 1956. 80 pp. 5 shillings.

Karl, H. See Schafarewitsch, I. R.

Lass, H. *Elements of pure and applied mathematics.* New York, McGraw-Hill, 1957. 11+491 pp. $7.50.

Lichnerowicz, A. *Lineare Algebra und lineare Analysis.* Berlin, VEB Deutscher Verlag der Wissenschaften, 1956. 11+303 pp.

Lichnerowicz, A. *Théorie globale des connexions et des groupes d'holonomie.* Rome, Cremonese, 1957. 15+282 pp. 4.000 lire.

Lieberman, G. J. See Resnikoff, G. J.

McCracken, D. D. *Digital computer programming.* New York, Wiley, 1957. 7+253 pp. $7.75.

McDowell, C. H. *A short dictionary of mathematics.* Introduction by H. O. Midonick. Part I. *Arithmetic and algebra.* Part II. *Plane trigonometry and geometry.* New York, Philosophical Library, 1957. 13+63 pp. $2.75.

Machol, R. E. See Goode, H. H.

Maddox, J. R. See Dugas, R.

Markuschewitsch, A. I. *Komplexe Zahlen und konforme Abbildungen.* Berlin, VEB Deutscher Verlag der Wissenschaften, 1956. 56 pp.

Markuschewitsch, A. I. See Priwalow, I. I.

Menger, K. *The basic concepts of mathematics; a companion to current textbooks on algebra and analytic geometry.* I. *Algebra.* Chicago, Illinois Institute of Technology, 1957. 7+95 pp. $1.40.

Midonick, H. O. See McDowell, C. H.

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